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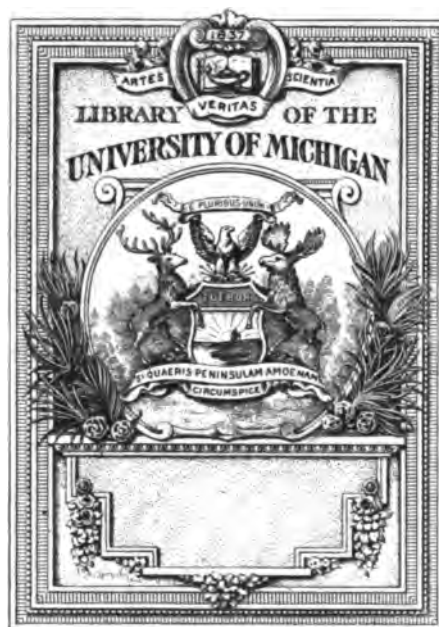
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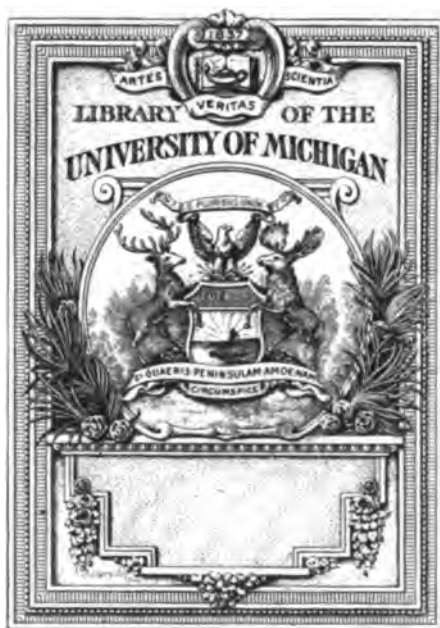
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Vol. 1.

JANUARY, 1859.

No. 1.

PROCEEDINGS.

FIRST MEETING (for the season), December 2d, 1858. The President in the chair.

The annual report of the Council, and also that of the Recording Secretary, were read and accepted.

The Librarian made the following report:

SOCIETY'S ROOMS,
New York, December 2, 1858. }

To the American Geographical and Statistical Society—

The Librarian would respectfully report:

That subsequent to his last report, submitted on the 4th November, 1858, five donations have been received, amounting to 30 volumes in octavo, and 4 pamphlets, in octavo, for which the thanks of the Society will be conveyed to the respective donors through the Librarian and Foreign Corresponding Secretary.

The Librarian would also respectfully call the attention of the Society to the gratifying fact, that during the past year, three hundred and ninety-nine donations have been made to the Library of the Society, comprising in the aggregate:

34 Maps,	217 Quarto Volumes,
143 Charts,	656 Octavo “
13 Folio Volumes,	81 Quarto Pamphlets,
	331 Octavo Pamphlets.

As it would be impossible at this time to enumerate all the donors who have been so liberal toward the establishment of a Geo-

graphical and Statistical Library, I beg leave to state, that the next number of the Society's Bulletin will contain, not only a complete catalogue of all the existing publications and maps, but also a list of all the donors.

Respectfully submitted.

MARSHALL LEFFERTS,
Librarian.

The Treasurer presented his annual report of the receipts and expenditures for the past year, which was accepted, and referred to a committee for auditing.

The Society then proceeded to the election of officers for the ensuing year, and the following gentlemen were chosen, viz.:

PRESIDENT:

FRANCIS L. HAWKS, D. D., LL. D.

Vice-Presidents:

HENRY GRINNELL, Esq.,
ARCHIBALD RUSSELL, Esq.,
JOS. P. THOMPSON, D. D.

Foreign Corresponding Secretary—JOHN JAY.

Domestic Corresponding Secretary—MARSHALL LEFFERTS.

Recording Secretary—JAMES W. BEEKMAN.

Treasurer—F. A. CONKLING.

Librarian—EGBERT L. VIELE.

Council—Henry E. Pierrepont, Henry V. Poor, Hiram Barney, George Folsom, Charles P. Daly, Frederick Primo, Daniel P. Noyes, Joseph B. Varnum, Jr., Robert B. Minturn, Jr.

The Hon. Isaac I. Stevens, M. C. from Washington Territory, read a paper before the Society on the "*Northwestern Territories*." A vote of thanks was tendered to Mr. Stevens, and a copy of the paper requested for the Archives of the Society.

Adjourned.

SECOND MEETING, Dec. 16, 1858. The President in the chair.

I. I. Hayes, M. D., of Philadelphia, (late Surgeon to the Second Grinnell Arctic Expedition,) read a paper on the "*Polar Discoveries of Dr. Kane, and a plan for further research*." On motion of Mr. Viele, seconded by Mr. Henry Grinnell, it was unanimously

Resolved, That the American Geographical and Statistical Society cordially approve of, and endorse the plan of Dr. Hayes for a continuation of the explorations and surveys of the Polar Seas, deeming it due alike to the cause of science and to our national character, that the discoveries of the Grinnell Expedition reported by Dr. Kane should not be disputed or ignored, without an effort being made to confirm the results achieved by our gallant countrymen.

Resolved, That a committee of five members of the Society be appointed to co-operate with Dr. Hayes in the organization of the expedition proposed by him; which committee shall report, from time to time, the progress of the organization, and shall give due notice of the time fixed for the departure of the expedition.

A vote of thanks was tendered to D. Hayes, and a copy of his paper requested for the Archives of the Society.

Adjourned.

THIRD MEETING, Jan. 6, 1859. The President in the chair.

The following letter was read from Mr. Conkling, resigning his office as Treasurer of the Society:

ROOMS OF THE AM. GEO. AND STAT. SOC., }
Thursday, December 23, 1858. }

To Francis L. Hawks, D. D., LL. D., President
of the Am. Geo. and Stat. Soc.—

SIR,—The discharge of a public duty will re-

quire my absence from this city for some months to come, and I accordingly resign the office of Treasurer of the Society. In doing so I venture to entertain the hope, that at some future day I may be permitted to contribute my humble efforts in support of a Society, the success and prosperity of which I have for years had greatly at heart.

I have the honor to remain,

Faithfully yours,

F. A. CONKLING.

Mr. Conkling's resignation was accepted, and Frank Moore, Esq., elected to fill the vacancy thereby created.

John Rae, M. D., of Montreal, and I. I. Hayes, M. D., of Philadelphia, were elected corresponding members of the Society.

Wm. Aymar, Jacob Harsen, James C. Mallory, George W. Hatch, Esqs., and Rev. Wm. Rudder, Rev. Dr. W. E. Eigenbrodt, and William Loyd, were elected resident members.

In accordance with the resolutions adopted at the last meeting of the Society, the President appointed Mr. Viele, Mr. Grinnell, Mr. Belmont, Mr. Lefferts, and Mr. Pierrepont, a special committee, to co-operate with Dr. Hayes in his plan for further research into the Arctic Regions.

The Rev. Dr. Adamson gave notice that he should introduce at the next regular meeting of the Society the following resolutions:

1. That the Corresponding Secretaries of such American Missionary Associations, as have Missionaries resident in foreign countries, or among the Indian tribes of the United States, be *ex-officio* members of the Society.

2. That a special committee be appointed, to organize and conduct a systematic correspondence with Missionaries resident in foreign countries, or among the Indian tribes of the United States.

Dr. Abraham Gesner, of Brooklyn, read a paper on the "*Fisheries of North America*." A vote of thanks was tendered, and a copy of the paper requested for the Archives of the Society.

Adjourned.

DEPARTMENT OF GEOGRAPHY.

NORTHWEST AMERICA.*

THE Northwest portion of the American Continent has been of late, and is now attracting much attention. The history of this region, though meagre, is interesting. The coast was explored in the latter part of the 18th century by English, American, and Spanish navigators. A Boston shipmaster gave name to the Columbia River and Gray's Harbor; a Spanish navigator is memorized in the Straits of De Fuca, and a Briton in Vancouver's Island.

About the same time, or shortly after these events, the Northwest Company and the Hudson's Bay Company pushed their explorations to the frozen ocean, and to the Pacific, in about lat. 52° N., and established trading posts all over this extensive territory. Two centuries had already been completed since the Jesuit Missionaries from New France had penetrated to the upper lakes and the Mississippi.

The explorations of Lewis and Clark, in the early part of the present century, made known to the world the two great rivers across the continent—the Missouri and the Columbia, and the general character of their basins. They were soon followed by the American trappers, who planted establishments both on this side and west of the Rocky Mountains.

The efforts of John Jacob Astor to found a great trading establishment on the Columbia, and to make tributary to it the whole western slope, by a system of posts, through misfortunes of various kinds failed; and the whole of that country, as well as the country northward to Hudson's Bay, and stretching from the Pacific to the Great Lakes, came under the control of a foreign company. Thus, so far as concerned the agencies at work to develop the country, the American people had control simply of the

portion east of the Rocky Mountains; all west of that range was maintained under another jurisdiction, solely as a hunting ground.

The treaty of 1846 established the line (lat. 49° N.) between the possessions of the United States and British America. In the same year, the wagon of the American pioneer scaled the mountains which had hitherto presented a formidable barrier against westward progress, and before its close, American citizens had carved out their homes on the shores of the western ocean.

Time rolled on—California and its vast mineral resources became known. Oregon, which had been healthfully and rapidly settling, became stationary, and many of the settlers went to California to dig for gold; and to the same attractive region the whole overland emigration was diverted. This condition of matters, however, was not of long duration. Gold was also discovered in southern Oregon, and large numbers of miners found remunerative employment; the tide of population again rose, and ultimately, in 1853, the northern portion of the territory was erected into a separate government, under the title of WASHINGTON.

Within the last four or five years rumors had spread abroad that gold existed over a large area in Washington Territory, and in the British Possessions to the north. The fact has now been verified, and the extent and richness of the diggings been established beyond doubt.

The present, therefore, appears to be an opportune moment, for presenting a careful consideration of the geography and resources of the regions involved in this enquiry and to indicate what may be the measure of their future development and destiny.

Looking on the map of North America, attention is arrested by the great mountain chain which traverses the continent north and south, between the Mississippi and the Pacific Ocean, and from which flow waters to either ocean. Great rivers having long distant courses reach the Gulf of Mexico, Hudson's Bay, the Frozen Ocean, and the Pacific Ocean. The upper tributaries of two of these—the Missouri and

* "Address on the "Northwest" before the American Geographical and Statistical Society, delivered at New York, December 2d, 1858, by Hon. ISAAC I. STEVENS, Member of Congress from Washington Territory." (Abridged.)

the Columbia—interlock in the very heart of the Rocky Mountains. The head of steam-navigation on the first is found at Fort Benton, 2,415 miles above St. Louis, to which point the Missouri is navigated by steamers carrying 150 tons of freight; and the navigable head of the great southern constituent of the Columbia is found at the confluence of the Palouse. The distance intervening between these navigable waters is only 450 miles—a distance when compared with the breadth of the continent, inconsiderable and easy to be overcome.

There are other streams second only in importance to the Missouri. The two branches of the Saskatchewan, that have their sources also in the Rocky Mountains, north of the Missouri, stretch a great distance eastward to Lake Winnipeg, and find their way northward into Hudson's Bay. They connect also with the main Columbia itself, affording transit for passengers and freight several months of the year; and thus the Columbia River and the two branches of the Saskatchewan have from the first been the great lines of travel of the Hudson's Bay Company's servants.

The Mississippi has also its source in this region, furnishing with its tributaries a long course of waters navigable by steamers, and affording a very close connection both with Lake Superior and the Red River of the North; and the Red River flowing northward, and in a direction opposite to that of the Mississippi, is also navigable within our own borders several hundred miles for steamers, and makes connection between our own system of rivers and those which flow into Lake Winnipeg and Hudson's Bay.

But the great feature of the Northern portion of the American continent is the water-line of the Great Lakes, which stretches more than half way across from the Atlantic to the Pacific. This fact is of deep significance, when we consider that vessels, without breaking bulk can pass thence to the Ocean, either by the Canadian canals and the St. Lawrence, or by the New York canals and the Hudson.

Thus we find that the country under exami-

nation is one of great natural water-lines across the continent—the Great Lakes, the Mississippi, the Red River, the Missouri, the Saskatchewan and the Columbia. Southward of this region the deficiency of navigable streams is remarkable. After leaving the Missouri, no navigation is again found until the Sierra Nevada has been crossed, and the lower valley of the Sacramento attained.

The mountain chains which characterize this country are the Sierra Nevada of California, and the Cascade Mountains of Oregon and Washington, stretching far to the northward. The Rocky Mountain chain has a vast extension in the parallel of San Francisco and Washington City and to the northward of the South Pass, and then diminishes in breadth still further north until it passes beyond the 49th parallel. Again there are, intermediate between these great ranges, many subsidiary chains which need not here be more specifically referred to.

Another peculiarity of the country of the Missouri and the Columbia is, that on the eastern slope the prairie region extends to the very base of the Rocky Mountains. From Fort Union, along the valley of Milk River to Fort Benton, there are no upheavals with the single exception of the Three Buttes, 3,000 feet high, which rise out of the prairie just under the 40th parallel, and about 100 miles eastward of the great chain.

The Rocky Mountain region, between lat. 46° and 49° N., is also essentially a country of prairies. West of the Bitter Root chain, a great plain stretches to the Cascade Mountains, and from the 48th to below the 46th parallel, this prairie region is for the most part well-watered, well-grassed, and furnishes a large portion of arable land.

There still remain to be considered the two great ports on the Pacific coast, San Francisco and Puget's Sound. San Francisco is the great port of California, and must ever be a leading key-point of commerce. But Puget's Sound is admitted by all naval and military men who have ever visited its waters, to be the most

remarkable road-stead on the shores of any ocean. It has 1,600 miles of shore-line, and a great number of land-locked, commodious, and defensible harbors. It can be entered by any wind, is scarcely ever obstructed by fog, and is the nearest point to the great ports of Asia of any harbor on our western coast.

Within the last twenty years this country has been considered as an inhospitable, cold and barren region, fit only for Indians, wild beasts, and hunters. Observation, however, has not verified this climatic character; but on the contrary, it has declared that the climate of Puget's Sound is milder than that of New York. Ice is never formed on its surface; nor snow found on its shores for more than a few days at a time; and the merchants of San Francisco have to go north to the Russian settlements to obtain their supplies of office.

The material resources of Puget's Sound and the country watered by the Columbia and Willamette, are literally inexhaustible. The whole country west of the Cascades has for the most part a fertile soil, a temperature so mild through the winter that cattle do not require fodder, and seed can be sown from September to March; and then the summers are glorious. The forests on Puget's Sound are a great source of wealth. Spars are not only sent to Asia, the Sandwich Islands, and Australia, but to the navies of England and France, while immense quantities of sawed lumber are sent to both domestic and foreign ports; and yet the lumber and spar business is in its infancy. Within one mile of the shores of the Sound there is more timber than can be found on all the tributaries of all the waters of Maine.

On the coast, from Columbia to Vancouver's Island, there are extensive fisheries of cod and halibut; and this portion of the coast also abounds in whales. On the east shore of the Sound, and on the Straits of De Fuca, there is coal of excellent quality, and well adapted for steamers. The country also abounds in water-power near the navigable waters.

From the Cascade Mountains to the Rocky Mountains, there is a vast pastoral and agricul-

tural region. The Yakima country is a good grazing country. In the portion immediately north of the Columbia, there is a single tract of 2,000 square miles of arable land. The Walla-Walla valley is a delightful region, its streams lined with cottonwood, the neighboring mountain spurs covered with pine; and nearly the whole country between these mountains and Snake River is arable, and one-half adapted for small farms. This valley, or rather re-entering of Snake River, is the great key of the interior, and can subsist a farming population of 100,000 souls.

The country west of the Bitter Root, and north of Snake River, and thence extending westward nearly to the Palouse, has a fertile soil adapted to wheat and cereals generally. As regards the portion west of the meridian of the Palouse, it is somewhat affected by drought, and is more of a grazing than an agricultural country. Nevertheless, on the line of the Columbia, on the shores of many of the streams and lakes, and in many of the intervening swales and valleys, tracts are found where there is abundance of arable land.

The country north of the Spokane to lat. 49° N. is wooded, and a very considerable portion is arable. The Bitter Root Mountains are covered with heavy timber—pine and fir, and larch and cedar. The Flathead country east of the Bitter Root, and along the eastern slope of the Rocky Mountains, has an area of arable land estimated at 12,000 square miles; and the country stretching from the Rocky Mountains to the rivers running to the Gulf of Mexico and Hudson's Bay, watered by the Upper Missouri, the Saskatchewan, and Red River of the North is adapted for the most part to settlement and civilization.

The time will come, indeed, when there will be agricultural settlements throughout the whole extent of this country, from the Mississippi to the Pacific, simply excepting limited extents along the higher parts of the mountain chains, and in some of the prairie regions. As illustrative of the capacity of the country it may be stated that the Indians east of the Cas-

cares are rich in horses and cattle, and that their general wealth is not exceeded by that of any civilized community on this continent. The Spokane and Flathead nations range the winter long without dried fodder; and there is no finer beef than that of the Walla-Walla country. At Fort Benton and Fort Union horses and cattle are maintained through the winter on the green herbage of the country.

Towards the advancement of this region much has already been effected. The country has been scientifically explored; a commencement has been made in surveying the public lands; some progress has been made in negotiating treaties with the Indian tribes, and the Indians themselves have recently been shown a memorable instance of the power and determination of the government of the United States to protect the lives of its citizens.

The discovery of gold in British Columbia has developed, on the part of the British people, an earnest determination to establish communication across the continent.

The United States government has already taken the initiative towards the same purpose; and here the two great powers enter upon the race for supremacy. The question is thus resolved into the practicability of establishing lines of travel from the water-line of the Great Lakes to Puget's Sound, that port which is the nearest of all American ports to Asia. It is not whether such an undertaking will inure to the benefit of specific localities; but whether this is not a project upon which rests the question as to whether the great carrying trade from Asia to Europe shall pass over American or British soil; or whether upon the success of this undertaking does not rest the question, whether the key of the North Pacific shall be in the hands of the American people, or in the hands of the subjects of a foreign power. If it be practicable to build a Railroad and establish this route, it is the duty of the American government to aid in the undertaking. It ceases, indeed, to be sectional and geographical, and rises into a noble and elevated nationality to which all hearts should yield a willing assent.

It is alleged that the severity of the climate and the excessive depth of the snows are insuperable objections against the construction of a continental railroad, along what is termed the northern route, and this even by men of intelligence, and in official reports. If these allegations were true, then the route as proposed would be fundamentally impossible; but let facts speak for themselves. In an examination of the country by the parties under Gov. Stevens in 1853, '54 and '55, the passes of the Rocky Mountains, Hell Gate, Northern Little Blackfoot, and Cadot's Pass, were crossed in December, January, February, and March, 1853-4, and in no one of these passes did they find more than 15 inches of snow. That same winter the party that crossed the Rocky Mountains in January, went down Clark's Fork in February, and the sole trouble met with was where the snow was deep enough to cover up the grass (they went on horseback); but in these cases it was in the wooded portions, and 30 inches was the greatest depth. When they again reached the prairies they found it but one foot deep; and every man of science knows what influence forests have in preserving the depth of the snows, and how it disappears on the cleared lands. There is one point alone on all the route about which our information is deficient, and that is the crossing of the Cascade Mountains to Puget's Sound; but it is the opinion of Gov. Stevens, that even here no serious obstruction occurs. The snow was but six feet for a short distance in the latter part of January, 1856. At Fort Benton and Fort Campbell, ever since their establishment, some 25 years ago, the fur companies have taken their goods to their winter-trading posts on the Milk and Marias Rivers in wagons, there not being snow enough for sleds. Will then the snows of this route, which do not prevent the Indians and traders from traveling, furnish any difficulties which will render it unusually troublesome for the passage of railroad cars?

With regard to the question of coldness, it is alleged, that it is so intense on the route of the 47th parallel, that it will be impracticable for

a large portion of the year to work men in the construction of the road, or to run cars for many days in the winter. Unfortunately for these opinions, we have observations on these points. And we have already great lines of railroad in operation over tracts of country as cold, and even colder than the route from Fort Benton to the Pacific. The mean winter temperature at Fort Benton, in 1853-4, was $25^{\circ} 38$; the average at Montreal on the Grand Trunk Railway for the same year was $13^{\circ} 22$, and at Quebec $11^{\circ} 03$. On the great Russian Railroad, the comparison is very similar; the mean winter temperature at Moscow is $15^{\circ} 20$, and at St. Petersburg $8^{\circ} 10$. At Fort Snelling, in 1853-4, it was $11^{\circ} 64$, and the mean of 35 winters was $16^{\circ} 10$. Thus, in the winter of 1853-4, an unusually cold winter, Fort Benton was 12° warmer than Montreal, 14° warmer than Quebec and Fort Snelling, 10° warmer than Moscow, and 7° warmer than St. Petersburg. In the Bitter Root Valley, the average temperature in the winter of 1853-4, was $24^{\circ} 90$, and in 1854-5 it was $30^{\circ} 30$, and the greatest cold at Cantonment Stevens was 29° . At Fort Snelling, in the same winter, it was 36° , at Montreal it was 34° , and at Quebec 29° below zero. Thus, on the proposed northern route the greatest cold is not equal to the greatest cold on the route of the Grand Trunk Railway; and the same fact is unquestionably true of the great artery of Russia. Taking the number of cold days, when the average temperature was below zero, we find 12 at Fort Benton, 10 at Ct. Stevens, 18 at Fort Snelling, 18 at Montreal, and 23 days at Quebec; and again taking the number of warm days, when the average temperature was above freezing point, we find at Fort Benton 43 out of 90 days, and at Ct. Stevens 32, against only 6 out of 90 at Fort Snelling, 5 at Quebec, 8 at Montreal, and 18 at Albany—all in the winter of 1853-4. But it may be objected that the temperature of Fort Benton and Ct. Stevens is not the measure of the temperature of the intermediate rocky range through which the route passes. Fortunately the party referred to in connection with

the depth of snow, made observations of temperature on the route, and it has been found by careful comparison that the passage was made during the extreme cold weather of that winter, and the temperatures observed therefore indicate the extreme cold of the pass, and not the usual cold. The mean temperature in the pass from 12th to 23d January, twelve days, was $10^{\circ} 10$. At Ct. Stevens the mean was $5^{\circ} 20$, and at Fort Benton $7^{\circ} 30$. The greatest mean cold of any day observed in the pass was 22° , against 24° at Fort Snelling, and a still lower figure at Pembina.

That the winter of 1853-54 was unusually cold in the mountain region is shown in the fact that in the Bitter Root Valley, the thermometer never went down to zero in the winter of 1854-5, whilst it fell as low as 29° in that of 1853-54. The average mean temperature of this valley in the winters of 1853-54 was $24^{\circ} 90$, whereas in 1854-55 it was $30^{\circ} 30$. The same general result, determined by observation, as regards the temperature of the pass, would be arrived at by using the formula that every 1,000 feet in altitude would depress the temperature 3° . Now when six miles of the pass is more than 5,000 feet above the sea, the greatest altitude being but 6,044 feet, and the average of the pass is but about 4,000. The pass, considering simply 165 miles of the distance, where the altitude exceeds 3,000 feet, will be only from 1° to 10° colder than Fort Benton, and except the six miles above mentioned, only from 1° to 7° colder. These facts, drawn from reliable records, ought to settle forever the question which has been raised prejudicial to this route—that it will be obstructed by snow and cold weather. So successful has been the great railroad from Moscow to St. Petersburg, that they are now pushing railroads in all directions, running them into regions truly Siberian; and the Canadian railroads are being extended westward utterly regardless of these objections, experience having shown their futility. It may, therefore, be assumed, that this northern route is entirely practicable as far as regards snow and cold; and that there can be

no greater obstacles to its construction and working than have been easily overcome in other portions of America, and in northern Europe.

We will now pass on to a more detailed view of the characteristics of the route and its relation to other routes. The distance from St. Paul and the western end of Lake Superior to the shores of Puget's Sound, is 1,800 miles. It is the shortest equated railroad line across the Continent, whether the eastern terminus be on the western border of the States, or on the Mississippi, or on Lake Superior, and it is much the shortest of all the surveyed routes, except those from San Diego and San Pedro, on the line of the 32d parallel. In connection either with the line of the great lakes and its system of canals and rivers, or the great railroad lines of the Canadas and the United States, it furnishes the most direct and cheapest route on the continent for freights and passengers from Asia to Europe and back again, and also between Asia and the Northwest, our West, our centre, our East, and the great seats of commerce on the Atlantic coast. The lineal distance on the route of the 32d parallel to the Mississippi, are 1,748 and 1,683, against 1,747 and 1,764, the lineal distances of Vancouver and Seattle from St. Paul, and against 1,733 and 1,750, the lineal distances from Superior City; and starting from the western border of the States, the lineal distances on the route of the 32d parallel are 1,598 and 1,533 miles, against 1,527 and 1,546 miles, the lineal distances from Breckenridge to Vancouver and Seattle.

The following table from official reports shows the distances on an air-line between the termini of the several explored practicable routes across the Continent, the lineal distances, the sums of ascent and descent, the equated distances in miles, the estimated cost, the extent of cultivable country, the extent of country which is less than 1,000 feet above the sea, and the extent varying from 1,000 to 9,000 feet, and the elevation of the highest pass on each of the routes which have been described in the preceding pages:

Routes.	Distance by Air Line.		Distance by proposed route.		Sum of Ascents and Descents.		Length of level route of equal work's exp'nses.		Comparative cost of routes in millions of dollars.		Route through cultivable country.		Route through land generally uncultivable.		Miles at an elevation above the sea, between		Altitude above the sea, of the highest point on the route.		Tunnels at an elevation of	
	Miles.	Miles.	Miles.	Miles.	Feet.	Feet.	Miles.	Dollars.	Miles.	Dollars.	Miles.	Dollars.	Miles.	Dollars.	Miles.	Feet.	Feet.	Feet.	Feet.	Feet.
Near 47th & 49th parallels,	1,247	1,644	21,787	1,968	95	1,224	320	130	433	733	180	62	6	...	6,044	5,195	...	...	...	...
—Breckenridge to Seattle	1,213	1,527	17,587	1,961	94	1,207	320	243	391	648	178	61	6	...	6,044	5,195	...	...	...	...
—Breckenridge to Vancouver	1,410	2,032	29,120	2,583	116	632	1,400	220	170	210	160	590	285	397	8,373	...	...	...	...	...
Near 41st and 42d parallels,	1,550	2,096	48,521	3,015	106	646	1,450	555	290	261	236	181	295	248	7,550	...	...	...	...	...
—Connell Bluffs via South	1,360	1,820	46,862	2,745	92	420	1,400	354	292	236	210	185	295	248	7,550	4,179	...	...	...	...
—Pass to Reno via South	1,630	2,024	38,200	2,747	90	834	1,190	893	347	120	342	271	60	...	5,717	...	...	...	...	...
Near 35th parallel,	1,400	1,598	30,181	2,169	68	408	1,190	478	337	120	342	271	60	...	5,717	...	...	...	...	...
—Ft. Smith to San Pedro	1,360	1,820	46,862	2,745	92	420	1,400	354	292	236	210	185	295	248	7,550	4,179	...	...	...	...
—Ft. Smith to San Pedro	1,360	1,820	46,862	2,745	92	420	1,400	354	292	236	210	185	295	248	7,550	4,179	...	...	...	...
Near 32d parallel,	1,630	2,024	38,200	2,747	90	834	1,190	893	347	120	342	271	60	...	5,717	...	...	...	...	...
—Fulton to San Francisco	1,400	1,598	30,181	2,169	68	408	1,190	478	337	120	342	271	60	...	5,717	...	...	...	...	...
—Fulton to San Pedro	1,360	1,820	46,862	2,745	92	420	1,400	354	292	236	210	185	295	248	7,550	4,179	...	...	...	...
—Fulton to San Diego	1,360	1,820	46,862	2,745	92	420	1,400	354	292	236	210	185	295	248	7,550	4,179	...	...	...	...

In the above table Breckenridge, on the western border of Minnesota, is assumed as the starting point of the northern route—a point which is a terminus of a railroad now actually

under construction by aid of a Congressional grant of land; and Council Bluffs, Fort Smith, and Fulton as the starting points of the routes near the 41st, 35th, and 32d parallels, respectively.

The following tables makes the eastern termini of the northern route at Superior City and St. Paul, and of the other routes at Rock Island, Memphis and Gaines' Landing on the Mississippi River:

Routes.	Distances by proposed line.	Sum of Ascents and Descents.	Level route of equal working expense.
	Miles.	Feet.	Miles.
Near 47th & 49th parallels,			
—Superior City to Seattle..	1,750	21,787	2,164
— " to Vancouver	1,733	17,587	2,067
—St. Paul to Seattle	1,764	21,787	2,178
— " " Vancouver....	1,747	17,587	2,081
Near 41st and 42d parallels,			
—Rock Island via Council Bluffs and South Pass, to Benicia	2,299	29,387	2,853
Near 35th parallel,			
—Memphis via Fort Smith, to San Francisco	2,366	48,791	3,285
—Memphis to San Pedro ..	2,090	49,132	3,015
Near 35th parallel,			
—Gaines via Fulton, to San Francisco	2,174	38,350	2,697
—Gaines " to San Pedro	1,748	30,331	2,319
— " " to San Diego	1,683	33,604	2,317

"If I am met," says Gov. Stevens, "with the objection that the Arkansas, Mississippi and Missouri are navigable, and that the routes on the 42d, 35th and 32d parallels should be stopped short at navigable waters, then, for purposes of comparison, I say very well, we will stop the northern road at Fort Benton, at the head of steamboat navigation of the Missouri, which will give a result vastly in its favor. I am of opinion, however, that the Mississippi valley and the great lakes is the proper eastern base. Thus we find—the western terminus of the routes of the 42d, 35th and 32d parallels, being San Francisco—that the lineal length of the northern route is 549 miles shorter than that of the 42d parallel, 616 miles shorter than that of the 35th parallel, 424 miles shorter than that of the 32d parallel; and that, as re-

gards the equated distances, the northern line is 689 miles shorter than the line of the 42d parallel, 1,121 miles shorter than the line of the 35th parallel, and 733 miles shorter than the line of the 32d parallel. But, looking to the eastern terminus, where are you when you reach the Mississippi on the route of the 42d 35th and 32d parallels?

"You are on a great navigable river, from which you can supply the Mississippi valley. But how will you reach New York, Chicago, Portland, Boston, Philadelphia and Baltimore?

"Will you tranship on the Mississippi, and take your winding course by the Gulf of Mexico, or take the rail, and seek some of the intermediate water lines which stretch along the whole distance?

"Will you make use of the Ohio, and the railroads and canals of New York, Pennsylvania and Virginia? On the northern route we are on navigable waters; we are now ready to enter our ships and go to Europe, or to New York; or, arrived at Montreal, we can pass by rail to Portland. If we compare Chicago as a great lake port with Superior City, its distance from Puget's Sound on the northern route, via St. Paul's, is 317 miles shorter than its distance from Benicia via South pass.

The lineal distances from Seattle via Northern Route and St. Paul, and from Benicia via South Pass, Council Bluffs and St. Louis, to these several ports of the Atlantic and Gulf coast, will be as follows:

	Seattle, via St. Paul.	Benicia via St. Louis.	Differences in favor of Nor'n route
Portland	3,249	3,831	582
Boston ..	3,352	3,696	344
New York	3,126	3,546	420
Philadelphia	2,988	3,454	466
Baltimore	2,966	3,355	389
Washington	3,004	3,375	371
Charleston	3,328	3,445	117
Savannah	3,313	3,430	117
Mobile	3,030	3,147	117
New Orleans	3,115	3,232	117
Average	3,131	3,453	

"The distance from Benicia to St. Louis is 2,482 miles.

"Thus the average distance from Seattle, via St. Paul, to the principal ports of the Atlantic and Gulf, is 316 miles less than the average from Benicia, via St. Louis, to the same points. This saving of distance, via St. Paul, ranges from 117 miles, as in the case of New Orleans, to 582 miles, as in the case of Portland. If the equated distances were used, it would make an additional difference in favor of the northern route of 137 miles. Thus every seat of commerce on the coast is nearer to Puget's Sound by the northern route, than to the waters of San Francisco by the central route.

"I am, however, of the opinion that no single line of railroad is the proper American solution of the problem of continental communication.

"The northern route should not alone be patronized by the government. The mail service now in operation, and about to be put in operation, indicates three lines which should share the patronage of the government; but these few facts as to distances, and the known relations between water lines and railroad lines, must show you conclusively that on this northern must pass the great carrying trade from Asia to Europe, and from Europe to Asia; that on this northern route must pass Asiatic supplies for much the largest portion of our own country and the Canadas. It is most emphatically a national route; and if we do not establish it, the British people and government will establish one north of the 49th parallel, and then we shall find ourselves in the position of the people, from whose hands had passed the sceptre of Judah."

The following table gives the sailing distances from the principal ports of Asia to those of our western coast. From this it will be seen that the average distance from the ports of Asia to Seattle is 25 miles less than to Vancouver, 63 miles less than to San Francisco, 368 miles less than to San Diego, and 65 miles less than to Mazatlan. As regards the four ports—the

mouth of the Amoor, Shanghae, Canton and Calcutta, the average distances are respectively 54, 206, 532, and 1,212 miles less than to the other ports:

From	To Seattle.	Van-couver.	S.Fran-cisco.	San Diego.	Mazatlan.
	Miles.	Miles.	Miles.	Miles.	Miles.
Amoor	3,850	3,895	4,110	4,520	5,390
Shanghae.....	5,140	5,215	5,430	5,830	6,700
Canton	5,900	5,975	6,140	6,550	7,380
Calcutta	8,730	8,805	8,970	9,380	10,210
Melbourne.....	7,280	7,205	6,930	6,990	7,125
Sandwich Isl'd	2,380	2,305	2,050	2,190	2,835
Average....	5,542	5,567	5,605	5,910	6,607

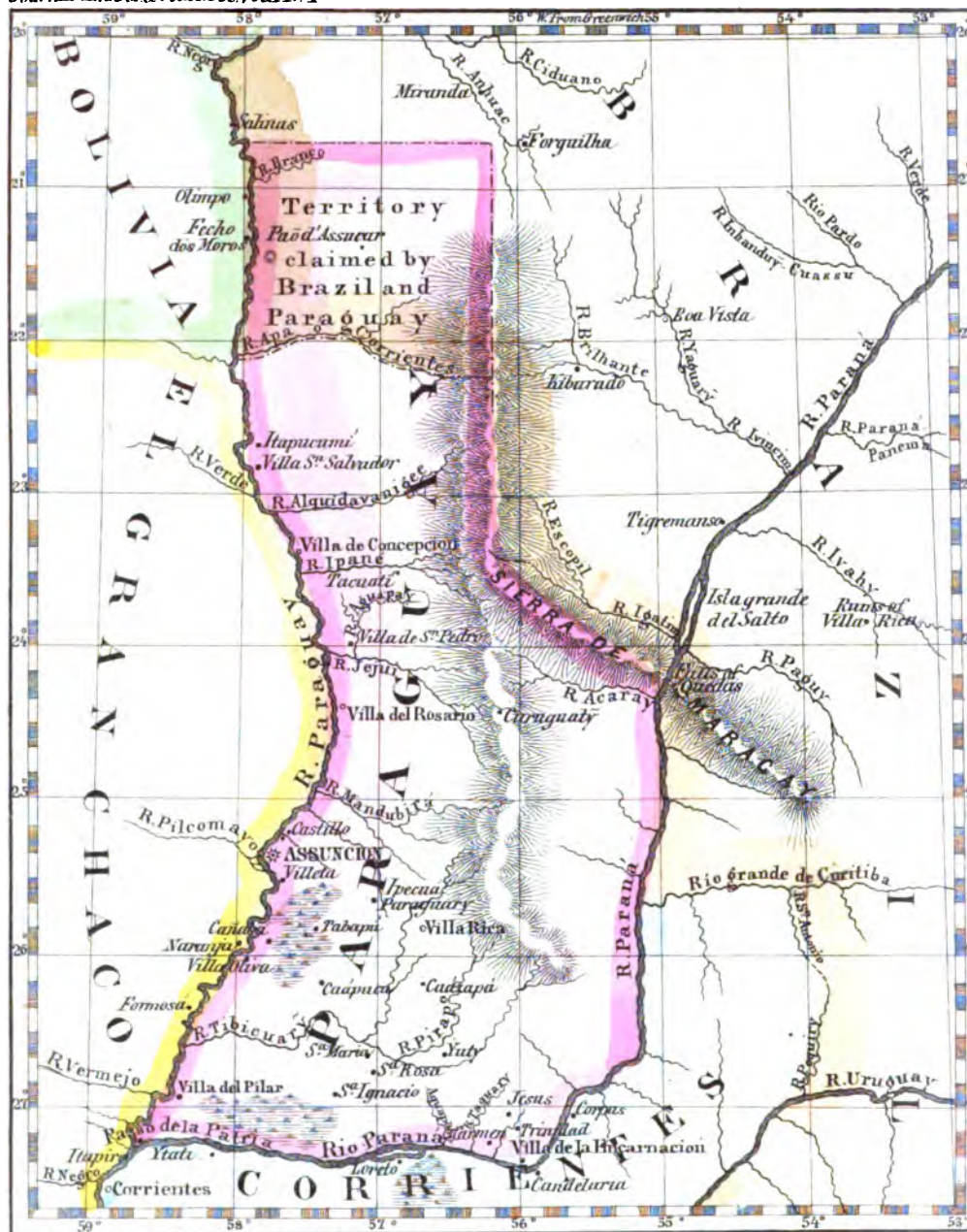
If we look to European connections, the following table gives the distances from Liverpool, Havre and Bremen, European ports, to Halifax, St. Johns, Portland, Boston and New York, American ports:

From	To Halifax.	St. Johns.	Portland.	Boston.	New York.
Liverpool.....	2,430	1,960	2,750	2,800	2,970
Havre.....	2,540	2,070	2,860	2,910	3,080
Bremen	3,080	2,610	3,400	3,450	3,620

There is a scheme on foot of a railroad communication from both Halifax and St. John's to Quebec. The distance from Halifax to Quebec will be 635 miles, and to Montreal 803 miles; and from St. John's to Quebec about the same distance—making the entire distance by railroad from western connections 511 miles shorter to Portland than to Halifax and St. Johns. This great increase of distance cannot compensate for the less ocean distance from the two British ports. We thus stand in this strong position—the great water line of the lakes and its system of canals and rivers has the shortest railroad connections with American ports both on the Pacific and Atlantic coasts, making Puget's Sound the great port for all seasons of the year, and Portland the winter port of the Canadas and the depot for the whole business which will pass over the rail. The natural inference is that the Northern route is not only an eligible one, but the most feasible of all the routes as yet projected or surveyed.

PARAGUAY.

Journal Am. Geo. & State Soc. Vol. 1 No. 1



Drawn by Geo. Schweter.

Lith by C. Fitzer 216 William Street New York.

Plate 2.



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PARAGUAY.*

Originally designating a vast region stretching northward to the 16th parallel of south latitude, and southward to the Straits of Magellan, and having an east and west extension from Brazil on the one side, and from the mountains on the eastern confines of Chili and Peru on the other side, the name Paraguay is now of more limited signification, and applied only to a comparatively small portion of its ancient territorial area, the present South American state of the same name.

* Recent events affecting our political and commercial relations with the Republic of Paraguay, have attracted public attention towards that country. Without expressing an opinion upon the necessity or policy of the expedition under Commander Page, which in accordance with the provisions of a resolution of Congress, has been fitted out and dispatched to the Rio de la Plata, it is nevertheless proper that a reference should be made thereto.

—The President of the United States, in his Annual Message to Congress of December, 1857, thus states the position of this country towards Paraguay: "It being desirable to ascertain the fitness of the River La Plata and its tributaries for navigation by steam, the United States steamer *Water-Witch* was sent thither for that purpose in 1853. This enterprise was successfully carried on until February, 1855, when, whilst in the peaceful prosecution of her voyage up the Parana River the steamer was fired upon by a Paraguayan fort. The fire was returned; but as the *Water-Witch* was of small force, and not designed for offensive operations she retired from the conflict. The pretext upon which the attack was made was a decree of the President of Paraguay, prohibiting foreign vessels-of-war from navigating the rivers of that state. As Paraguay, however, was the owner of but one bank of the river, the other belonging to Corrientes, a State of the Argentine Confederation, the right of its government to expect that such a decree would be obeyed cannot be acknowledged. But the *Water Witch* was not properly speaking a vessel-of-war. She was a small steamer engaged in a scientific enterprise, intended for the advantage of commercial states generally. Under these circumstances I am compelled to consider the attack upon her as unjustifiable, and as calling for satisfaction from the Paraguayan government.

"A demand for these purposes will be made in a firm but conciliatory spirit. This will the more probably be granted, if the Executive shall have authority to use other means in the event of a refusal. This is accordingly recommended."

Upon this recommendation, Congress authorized the Secretary of the Navy to equip a sufficient number of vessels and dispatch them to the La Plata. The fleet consists of 2 frigates, 2 sloops-of-war, 3 brigs, 12 armed steamers, and 2 armed store-ships. Of these, 1 sloop, 3 brigs, and 12 steamers, can ascend the river to Asuncion, the capital.

The Republic of Paraguay is situated between $21^{\circ} 20'$ and $27^{\circ} 18'$ of south latitude, and $54^{\circ} 20'$ and $58^{\circ} 40'$ of west longitude. It forms a very compact territory nearly in the shape of a parallelogram, about 420 miles long, north and south, with an average width of from 180 to 200 miles, with an area is computed at 86,000 square miles—about twice the superficies of the State of New York.

The northern limit of this country, towards Brazil, is only vaguely ascertained. In all other directions it enjoys the advantage of well-defined natural boundaries—the great river Parana on the east and south, and its scarcely less magnificent tributary, the Paraguay, on the west. At the southwest corner of the state the Paraguay joins the Parana, and the united stream taking a southerly course through the very heart of the Argentine Confederation, is joined by the Uruguay in latitude $34^{\circ} 20'$, and then merges its waters into the great estuary of La Plata. The state is thus accessible from the sea by one of the grandest river systems of the world, and several of its interior waters may be navigated by steamers of considerable tonnage.

The Paraguay and the Parana, however, differ greatly in their character as navigable rivers. The Paraguay is navigable in all its extent in this country, though its course is somewhat rapid in the north, near the rocky barrier, called Fecho dos Morros, ($21^{\circ} 20'$ N. lat.). Vessels of 300 tons may ascend it to Asuncion, and smaller vessels for several hundred miles further, and far within the boundaries of Brazil. The Parana which runs along the southern and eastern sides of the country is much less favorable to navigation. The great cataract, called Salto de Sette Quedas, near 24° S. latitude, forms an insuperable impediment, and even lower down there occurs several difficult passages where the river descends in long rapids over rocky shoals.

Almost insulated by these two rivers, the whole surface of the state belongs to their respective basins. A north and south mountain range of considerable elevation forms their

water-shed, sending the drainage in opposite directions. The distance of the water shed from the rivers scarcely anywhere exceeds a hundred miles, and hence the tributaries by which the drainage is conveyed are more remarkable for their number than for magnitude. By far the largest of these is the Tibicuary, which, owing to an easterly bend in the dividing ranges has its course considerably prolonged, and being augmented by several large affluents becomes a noble stream before it reaches the Paraguay.

The surface is also mountainous in the north-east, where a ramification known by the name of the Sierra de Maracay, breaks off from the central chain, and proceeding east to the banks of the Parana, interrupts the navigation of the river and forms one of the most remarkable cataracts in the world, and of which mention has already been made, under the name of the Salto de Sette Quedas. The river, which above the rapids is 12,600 feet wide, here enters a deep narrow gorge, and becoming suddenly contracted to 180 feet, pours down an immense flood with tremendous fury, and a noise which is heard at the distance of eighteen miles.

From the mountain region the surface rapidly descends, first presenting a finely diversified succession of lower heights, and then spreading out into rich alluvial plains, which not unfrequently in the immediate vicinity of the larger streams are converted into swamps and morasses.

The climate of Paraguay, though part of the country is within the tropics, has its excessive heats greatly modified by the inequalities of the surface; but concurs, with the natural fertility of the soil, in producing a vegetation of great luxuriance and grandeur. Unlike the open country surrounding it, Paraguay is well-wooded, and among its trees are many valuable in the arts and manufactures. It also abounds in medicinal productions, as rhubarb, sarsaparilla, jalap, sassafras, dragon's blood, capaiva, nux-vomica, liquorice, ginger, etc.; and in dye stuffs, as cochineal, indigo, vegetable vermillion, saffron, etc. Many of the forest trees yield valuable gums. The seringa, or rubber tree,

the products of which are now almost a monopoly with Para, and also the palo-santo, which produces the gum guaiacum, crowd the forests; and the sweet-flavored vanilla is abundant. Upon the hills the yerba mate, (*ilex Paraguensis*), flourishes luxuriantly, and furnishes the material of the universal beverage of South America. The plains pasture thousands of cattle, which though scarcely required for food in a country otherwise so richly provided, yield invaluable products in the shape of hides, tallow, hair, horns, bones, etc.

Thus, in all that constitutes an agricultural country—rich lands, a fine climate, and abundance of water—Paraguay has scarcely an equal. On the alluvial tracts, where cultivation is attempted with implements however primitive and imperfect, sugar cane, cotton, tobacco, rice, maize, and in short, the greater part of the most valuable products of the tropical and temperate zones are raised in profusion. If fully developed, indeed, this country would probably furnish a larger amount of human subsistence than any other tract of equal extent on the surface of the globe. Hitherto, however, various political causes have seriously interfered with its advancing prosperity. Its future can only be measured from its resources and fluvial facilities.

The wild animals of Paraguay include the jaguar or tiger, (of which there are great numbers); the puma or cougar, called also the American lion; the black bear, the ant-eater, the tapir, the capibara or water-hog, river-cavies, and various amphibious animals. Alligators are numerous in the Paraguay, and are of immense size. The wild boar, deer, and other species less known inhabit the forests; snakes, vipers, scorpions, etc., abound, and it is estimated that there are twenty different kinds of serpents, of which the rattle-snake is the most common. The boa-constrictor is found in the river swamps. Among the feathered tribes are the cassowary or American ostrich, the pea-fowl, parrots of various species, papagayos, parroquets, gold-finches, nightingales, and nine species of the humming-bird. Wild geese

abound on the rivers and lakes. Insects are found in great variety, and of extraordinary size.

The mineral resources of Paraguay are comparatively unknown; but it is supposed, and analogically proved, that both the precious and more useful minerals abound. About 17 leagues from the capital is a mountain called Acai, near which the inhabitants frequently find small lumps of silver. The policy of the government, however, has ever been to disclose as little on this subject as possible, and on one occasion a watchmaker, who had extracted gold from some ore found in the interior, was commanded by Francia, not to mention the circumstance on pain of death.

Authorities differ in estimating the amount of population in the country. Some say 300,000, others 1,000,000, and Hopkins makes it even 1,200,000 souls. The smallest estimate would make it more populous than other South American states. The dominant inhabitants are the descendants of Europeans from the north of Spain. Caste here is carried to a great extent, and the feeling of aversion which the white population entertains towards the natives, even the despotic power of Francia was unable to break down.

Of the Aboriginal tribe, the Guaranis, who inhabit the Chaco are the most numerous. The Paraguayans inhabiting the left bank of the Paraguay river are chiefly porters. A tribe called the Tobayas are a common enemy, and the government has often to make vigorous efforts to repel their inroads. Dr. Francia, however, appears to have succeeded in bringing these people into a more perfect state of civilization and subordination than has ever before been done with any nation of American Aborigines. The number of Indian villages and missions is very considerable. They generally consist of stone or mud houses covered with tiles, and have a large open square in the center in which is usually the priest's house and a church. The number of inhabitants in each is seldom less than 600, and often exceeds 2,000.

The religion of the country is the Roman Catholic, and none other is allowed to be pub-

licly exercised. Schools exist in every part of the republic, and the people are generally better educated than their neighbors in the bordering provinces. Every white male child, indeed, is obliged to attend the parish school until it has acquired the rudiments of an education. The public press consists of only two weekly newspapers, which circulate about 36,000 copies annually. The "Paraguay," issued at Asuncion, is the government organ.

The industrial position of Paraguay is probably superior to that of any other of the Spanish-American states. Secluded from commercial intercourse with foreign countries, the inhabitants have for centuries been obliged to supply their own wants. Thus, all the common handicrafts are known to them, and under Francia every one was obliged to labor at some useful occupation. Nothing whatever under his regime was brought into, or carried from the country. Since 1852, however, a new element has been added to the national industry, viz.: external commerce, which has already changed materially the aspect of affairs, and is constantly advancing.

In the years 1852-1856, the inter-changes—imports and exports and the total commerce—are reported as follows:

Years.	Imports.	Exports.	Total.
1852	\$540,150	\$474,499	\$1,015,549
1853	406,688	691,932	1,098,620
1854	535,523	777,457	1,362,980
1855	537,819	811,982	1,349,801
1856	610,865	1,006,059	1,616,924

The amount of tonnage employed in the foreign trade of Paraguay, in 1856, distinguishing the clearances and the entrances, and the nationality, was as follows:

Nationality.	Cleared.		Entered.	
	Vessels.	Tons.	Vessels.	Tons.
British	4	1,165	4	1,165
French	1	84	1	84
Sardinian	3	705	3	705
Brazilian	1	27	1	27
Argentine	147	6,937	139	6,440
Buenos Ayrean }				
Uruguayan	12	998	14	1,025
Paraguayan	22	1,461	9	477
Total	190	11,377	171	9,923
Of which, entered in ballast			85	3,268

The clearances for the 5 years ending with 1856, are stated in the following table :

Years.	Vessels.	Tons.	Men.
1852	90	4,813	599
1853	173	8,062	1,071
1854	165	7,694	1,065
1855 (10 months)	144	9,295	1,204
1856	190	11,377	1,458

And the following table gives the entrances for the same period :

Years.	Vessels.	Tons.	Men.
1852	93	5,192	612
1853	151	6,763	826
1854	160	7,888	1,028
1855	151	9,241	1,162
1856	171	9,923	1,267

The chief export is the yerba mate, the sale of which is a government monopoly, and which is seldom shipped on merchant's account. The next most valuable staple is tobacco (of very fine quality), of which in 1854 there was shipped 2,600,000 pounds; in 1855, 6,780,000 pounds, and in 1856 upwards of 8,000,000 pounds. The export of hides, raw and tanned, in 1856, was 35,000—a great diminution from former years. It is said that the production of this staple is falling off. Timber and dye woods, hair, leather, molasses, rum, almidon or starch, corn, peanuts, beans, cigars and oranges, also enter into the export trade. The chief imports are foreign goods, principally English and French manufactured goods, wines, &c.

The coasting trade is not open to foreign bottoms, and is carried on solely by native boats. It is not of much present account. There is also a considerable contraband trade carried on over the Brazilian and Argentine frontiers.

Asuncion is the only port of entry open to foreign commerce. Encarnacion, Pilar, etc., are visited by Argentine and Buenos Ayrean vessels.

Previous to February, 1856, the amount of paper money in circulation was \$330,000. At that date a new issue was made of \$570,000—making the whole now in circulation \$900,000.

The revenue derived from customs on imports and exports averages about 10 per cent. on the value. The total revenue of the State is about \$750,000 per annum.

The only town of consideration in the republic is Asuncion, the capital. It is situated on the left bank of the Paraguay, a short distance above where it is joined by the Pilcomayo, 660 miles above Buenos Ayres, in latitude 25° 18' south, and longitude 57° 35' west. Originally a small Spanish fort, it has now become a place of some importance, and contains about 12,000 inhabitants. This is due to its advantageous position. It has a cathedral, three churches, four convents and monasteries, a college and theological seminary, and a hospital. Otherwise it is an ill-built and irregular town, most of the houses being built of mud, and the streets crooked and unpaved. The inhabitants carry on a considerable trade in tobacco, timber, hides and sugar, and especially in mate or Paraguay tea, with which Paraguay supplies nearly the whole of South America.

North from Asuncion are the towns of Castillo, Rosario, Concepcion and Itapucumi on the river, and San Pedro, Tacuaté and Curuguaty in the interior. South of the capital are the towns of Villeta, Olivia and Pilar. In the interior, towards the southeast, are Villa Rica and several other small towns; and on the Parana, near its southernmost bend, Encarnacion, Carmen, etc. These have populations varying from a few hundreds to one and two thousands, chiefly civilized Indians.

After the Spaniards had discovered the wide embouchure of La Plata, they sailed upwards and attempted to establish a colony on the banks of the river. But in two attempts of this kind they failed, the settlements having been destroyed by the Indians of the plains. In 1535 the, Adelantado, Don Pedro de Mendoza was sent out with a considerable number of vessels to found a great colony. He sailed up the Parana and Paraguay for nearly a thousand miles until he arrived at the present site of Asuncion, where he founded a town. From this point the Spaniards by degrees spread over all the countries of South America, south of the 20th parallel and east of the Andes.

In the 16th century the Jesuits were sent to these parts for the purpose of converting the

natives to Christianity. Their success, however, was not great until they obtained from the Spanish court a mandate, (1690), forbidding all other Spaniards to enter their missions without their permission.

The Jesuits, thus protected, settled among the numerous tribe called the Guaranis on both sides of the river Parana, above the island, of Apipe, and succeeded in bringing them to a certain degree of civilization. When the brotherhood were expelled in 1767, the missions were inhabited by more than 100,000 civilized Indians, of whom perhaps less than half the number were in Paraguay. They afterwards dispersed through the different parts of La Plata; but it seems that the majority settled in Paraguay, which, after that time, was entirely subjected to the viceroy of Buenos Ayres, and so continued, until the outbreak of the revolution which gave independence to all Spanish South America.

The dismemberment of the vice-royalty took place at the close of 1813. It began with Paraguay; but strictly speaking this republic could at no time be said to have formed any portion of the United Provinces as created by the patriots. It never joined in any confederacy with them; but at once in 1811 established on the ruins of the Spanish power, an independent government; and secured its independence from colonial vassalage more by the advantages of isolated position, than by any exertion on the part of the inhabitants.

Dr. Francia, whose history is that of the Republic from its independence, began his political career as secretary to the revolutionary junta in 1811. He afterwards became joint consul, and then sole consul, and in 1814 he was elected dictator for three years. In 1817 he caused himself to be elected dictator for life.

He now commenced that political system which has rendered him so famous in the world's history. He adopted as his established principal complete non-intercourse with all the world; and his government became more and more despotic at home, and the more a curse to the country. His tyranny, justly regarded as one

of the most remarkable political phenomena of modern times, was maintained by a system of espionage so vigorous, and at the same time so widely spread, as to bring fear and distrust into every household.

Robertson says that, ten years before the death of Francia, "the prisons were groaning with their inmates, commerce was paralyzed, vessels were rotting on the river-banks, produce going to decay in the warehouses, and the insolence of his soldiers was systematically encouraged as the best means of striking terror into the hearts of the crouching and insulted citizens. Distrust and fear pervaded every habitation, the nearest friends and relations were afraid of each other, despondency and despair were written on every countenance, and the only laughter heard in the city was that of Francia's soldiers over their revels in the barracks, or their exultation over the affronts offered to unoffending citizens in the streets."

Such is a picture of the country under the rule of this singular man.

At length, as full of crime as of years, Francia expired at the age of eighty-two—one of the few tyrants who have quietly died in their beds at an old age and in the plenitude of their power. He left his country impoverished, not a dollar in the treasury, and not a public or private paper of his administration unburned.

After his death (1840), a popular congress elected again two consuls to serve for two years, and the people once more breathed the air of liberty. The first acts of these magistrates were to declare the nation open to foreigners and universal commerce. In 1844 a constitutional government was established, at the head of which was placed as President, Don Carlos Antonio Lopez, who has continued and expanded the policy inaugurated by the consulate.

The benefits of this liberal arrangement, however, were for many years frustrated by the selfish policy of the government at Buenos Ayres, which, taking undue advantage of its command of the outlet of the Parana, was only too successful in crippling the trade, not only of Paraguay, but of the extensive regions be-

yond it, abounding in valuable products, to which the Parana and Paraguay furnished the only available means of transport.

This policy on the part of Buenos Ayres provoked a wide resistance, which was aided by France and England, and resulted in the flight of Rosas, the Dictator of that province, in February, 1852. This event at once changed the aspect of affairs. On the 1st of October following, in accordance with a decree of the Provisional Director of the Argentine Confederation, dated 31st August, the navigation of the Rio de la Plata, the Parana, and the Paraguay were opened to all foreign vessels, and on the 13th October of the same year, the representatives of the province of Buenos Ayres recognized the authority of the decree.

Thus the great rivers, after being closed against general commerce from the first occupation of the country by the Spaniards, were declared free. The consequences of this important concession are in the future, but there can be no doubt of its being the cause of an early development of the whole country drained by these magnificent streams, which have, according to a rough estimate, and including their navigable tributaries, a line of navigation not less than 10,000 miles in length.

GEOGRAPHY OF THE UNITED STATES OF AMERICA.

NO. 1.

A SERIES of articles upon the Geography of the United States, having very considerable reference to meteorological phenomena, appropriately commence with a description of the immediate valley of the Mississippi River, as it occupies the lowest depression in the great interior basin, and possesses a temperature and rain-fall less affected by causes disturbing what may be called a meteorological equilibrium, than any other portions of the continent at similar distances from the sea. The data thus obtained may be taken as a standard, or unit of measure, to which to refer the changes in the earth's surface as we leave either bank of the river,

and the consequent changes in meteoric conditions—a method of proceeding which will greatly simplify and facilitate future enquiry.

At the mouth of the Mississippi River, the astronomical, and actual or observed, mean temperatures, very nearly coincide. At New Orleans, (104 miles from its mouth), which is elevated only ten feet above the Gulf, in lat. 30° N., the astronomical mean temperature is $71^{\circ} 01'$, while the observed mean temperature is 69° *Fahr.* On proceeding northwardly, the difference between the two rapidly increases, owing to the increased elevation of the bed of the river, and to the influence of the lofty plateaus and mountain ranges that form the boundaries of its hydrographic basin. On the parallel of 35° the astronomical mean temperature is $67^{\circ} 17'$; the observed mean 60° . On the parallel of 40° the astronomical is $62^{\circ} 81'$; the observed 53° ; and on the parallel of 45° the astronomical is $57^{\circ} 98'$; the observed mean temperature $44\frac{1}{2}^{\circ}$. Other meteorological changes, particularly in the amount of rain-fall, follow, though not with similar regularity or extent. To show the degree of the southerly slope of the great basin of the Mississippi, and how far, what may be termed normal conditions are affected as it is ascended, a tabular statement is subjoined of the latitude of the several points of observation; their distances from the Gulf, and from each other; their elevation* above the sea; the rate of the descent of the river between them; their mean annual temperatures and rain-fall—with their respective means for the seasons. The authority for altitudes is

* The only interruption to the general character of the Mississippi from the Gulf of Mexico to the Falls of St. Anthony, are the Des Moines and Rock Island Rapids. At both of these, the river runs for a considerable distance over beds of solid rock, having inclinations, as will be seen in the table, of nearly two feet to the mile. In stages of high water they present no obstacle to the passage of the largest class steamers; but at low water, only boats of light draft can pass them. The falls on the Ohio at Louisville, and on the Wabash at Vincennes, are of a similar character, and are probably caused by a continuation of the same outcrop, that causes the Rapids at the mouth of the Des Moines River. With these exceptions, the river below the mouth of the Ohio has a muddy bed; north of this point the river bed of gravel or sand, the solid rock appearing, we believe, is only in the instances named.

Nicollet, in most instances; and for temperature and rain-fall, the observations at the United States' military posts.

Places of observation.	Latitudes.	Elevation above sea.	Distance from Gulf of Mexico.	Distance between places.	Descent per mile betw'n places.	Annual.	Spring.	Summer.	Autumn.	Winter.	Annual.	Spring.	Summer.	Autumn.	Winter.
New Orleans.....	29° 57'	10.5	104	104	1.2	69.9	70.0	82.3	70.7	66.5	51.21	10.57	13.31	12.67	15.22
Mouth of Red River.....	31° 07'	76.	340	236	..	67.1	68.0	81.0	67.1	52.2	57.75	14.92	13.06	13.33	16.44
Natchez.....	31° 34'	86.	406	66	..	60.8	61.1	78.1	61.4	42.6	41.80	11.00	7.80	7.90	15.00
Memphis.....	35° 08'	195.7	970	564	..	64.5	64.1	76.2	65.4	32.3	42.32	12.86	14.14	8.94	6.29
Mouth of Ohio River.....	36° 58'	275	1,216	246	2.6	..	..	..	..	..	..	..	..	..	..
St. Louis.....	38° 40'	364	1,390	174	..	..	..	..	..	..	..	..	..	..	..
Mouth of Illinois River.....	39° 58'	382	1,426	36	6.0	..	..	..	..	..	..	..	..	..	..
Mouth of Des Moines River.....	40° 24'	444	1,594	168	4.5	..	..	..	..	..	..	..	..	..	..
Montrose, (at head of Lower Rapids).....	40° 31'	470	1,609	15	20.8	..	..	..	..	..	..	..	..	..	..
Muscatine.....	41° 26'	..	1,693	69	..	46.7	46.4	68.6	48.9	22.8	44.33	11.19	15.08	10.34	6.72
Rock Island.....	41° 30'	528	1,722	29	6.1	50.3	50.5	74.1	51.7	24.9	..	..	..	..	..
Head of Upper Rapids.....	41° 41'	554	1,737	15	20.8	..	..	..	..	..	..	..	..	..	..
Dubuque.....	42° 29'	..	1,848	111	..	49.4	50.4	72.1	52.5	22.5	31.80	7.63	11.87	7.90	4.0
Prairie du Chien.....	43° 05'	627	1,932	84	4.5	47.6	48.7	72.3	48.3	21.2	..	..	..	..	..
Mouth of Black River.....	44° 10'	683	2,035	103	6.5	..	..	..	..	..	..	..	..	..	..
Mouth of St. Croix River.....	44° 42'	729	2,150	115	5.0	..	..	..	..	..	..	..	..	..	..
Mouth of Minnesota River.....	44° 53'	744	2,192	42	4.6	44.6	45.6	70.6	45.9	16.1	25.43	6.61	10.92	5.98	1.92

From the above statement it will be seen that the rate of descent of the Mississippi below its junction with the Ohio is 2.6 inches to the

mile; while the rate between the mouth of the Ohio and the mouth of the Minnesota River is 5.76 inches. That portion of the river extending from the mouth of the Ohio to the head of Rock Island Rapids, falls more rapidly than that between the latter place and the Minnesota River—the rate in the one case being 6.4 inches to the mile, and in the other, 5 inches. The rate of descent of the upper portions of the Missouri River, compared with the lower, present a similar anomaly. The St. Lawrence River has in the same manner the greatest portion of its descent midway between its sources and outlet. The total fall of the Mississippi, from the mouth of the Minnesota to the Gulf, is 744 feet in a distance of 2,192 miles; or at the rate of 4.07 inches to the mile.

In ascending from the mouth of the Minnesota, the lowest depression in the great interior basin is occupied by that river. A short distance from its junction with the Mississippi, the latter has an abrupt fall of 47 feet, which forms a complete bar to the further progress of steamboats. Its navigation from this point to its source is frequently interrupted by falls and rapids. From the Falls of St. Anthony to Itasca Lake, the source of the river, the total descent is 831 feet, in a distance of 704 miles—or at the rate of 14.15 inches to the mile. Upon portions of the river between the rapids, the descent is sufficiently gentle for navigation, and steamboats are now running from St. Anthony to Sauk Rapids, a distance of about 60 miles. Above these rapids there are still longer stretches of slack-water. From Lake Itasca the distance to the summit of the dividing ridge between the basin of the Mississippi and that of the Red River of the North is only 6 miles. This is elevated 1,680 feet above the Gulf, and is 2,896 miles from it by the course of the river.

As before stated the great depression in the continent, between the Gulf of Mexico and Hudson's Bay, is occupied by the Minnesota River, though much inferior in size to the Mississippi at their junction. This river rises in Big Stone Lake, 441 miles from its mouth. The

lower portion of it has a rate of fall still more gentle than the upper portion of the Mississippi. For the first 190 miles of its course it falls 67 feet, or at the rate of 4.2 inches to the mile. In 441 miles it falls 222 feet, or 6 inches to the mile. Big Stone Lake, with a comparatively slight expenditure, could probably be made accessible to steamboats from the Gulf of Mexico. At present boats ascend the Minnesota more than 200 miles. Big Stone Lake is on the same level with Lake Travers, the source of Red River of the North. They lie contiguous, and could be easily connected. It is stated that in wet seasons, canoes pass without difficulty from one to the other. Red River is navigable from Lake Winnepeg nearly to Lake Travers, and could easily be rendered so to the lake. The day may not be far distant in which steamboats will pass from the Gulf of Mexico to the head of Lake Winnepeg, a distance of 3,500 miles, and, by an improvement of the falls at the mouth of the Saskatchewan, by that river, to the base of the Rocky Mountains, some 1,500 miles further. It is somewhat remarkable that the highlands at the head of the Mississippi River should have a less elevation than at the head of any of its important tributaries. Lake Winnepeg is elevated 853 feet above the sea, and is only about 113 feet below the lowest summit of the water-shed between the Gulf of Mexico and Hudson's Bay. From Lake Travers on the summit to Lake Winnepeg, the distance by a direct line is about 350 miles, and by the Red River probably 550 miles, showing a rate of descent of this river of about 2.5 inches to the mile. These facts afford a striking illustration of the gentle slopes which characterize the great interior basin in both northerly and southerly directions. They descend so gradually that the rivers draining them are navigable for steamboats almost to their sources, and open markets to far distant regions, which, with rivers falling from them at the rate of 12 inches to the mile, must for generations, if not for centuries, have remained unoccupied wastes. As the head waters of the Mississippi and the Red River of the North interlock, and on the

same level, so that with a slight improvement, steamboats could be made to pass from the Gulf of Mexico to the hydrographic basin of Hudson's Bay; in the same manner the head waters of the Illinois River and the Upper Great Lakes occupy a similar level—the former, in times of floods, throwing a part of its water into Lake Michigan. A cut of 8 feet in depth would turn the waters of the lakes into the Gulf of Mexico, so nicely poised in the centre of the continent are these great inland seas. By means of the Illinois Canal large boats pass from one basin to the other. These facts present, in a remarkable manner, the provision made by nature for the internal commerce of the country. Had the dip of the southern slope of the Great Mississippi basin been at the rate of 12, instead of 4.7 inches to the mile, the entire condition and destiny of the American continent would have been changed. Instead of a nation of 30,000,000, already occupying more than 1,000,000 square miles, every portion of it traversed by natural and artificial navigable water courses, and by nearly 30,000 miles of railroad, all the territory we should have occupied would have been a narrow belt lying immediately on the sea shore, from the difficulty of carrying the bulky products of the interior to market.

The highest elevation between the Gulf of Mexico, and the rivers falling into Lake Winnepeg, west of the Missouri and its tributaries, will not probably exceed 2,000 feet. These lie at the head of Big Sioux River, and west of Big Stone Lake, at the head of the Minnesota River. The summit of the ridge, at the head of the Mississippi, is, as we have already stated, 1,680 feet. The lowest point between the Mississippi and Lake Superior, at their nearest approach in lat. $46^{\circ} 45' N.$, is 1,324 feet, or about 700 feet above the lake, and 80 feet above the river. The hills that form the water-shed of the south shore of Lake Superior rise to an elevation of about 1,500 feet, although at the head of St. Croix river there is a depression in the summit, which is only 356 feet above the lake, and is almost exactly in the same level

with the lowest summit between the Minnesota, and the Red River of the North.

The meteorological phenomena at the different points on a river traversing 20° of latitude must, under all circumstances, be extremely varied. The difference in the mean temperature between New Orleans and the mouth of the Minnesota River, is 25° 3, and the difference in the mean annual rain-fall, is 25.78 inches: in other words, twice as much rain falls at the former as at the latter place. But the difference of summer temperature between the two places is only 11° 7 *Fahr.*—that at New Orleans being 82° 3, and at the mouth of the Minnesota, 70° 6. At New Orleans the average amount of rain-fall for summer is 13.35 inches, and at the mouth of the Minnesota, 10.92 inches. As only one important crop is annually grown in any part of the valley, and as every portion of it has, for the summer months, sufficient heat and moisture for the maturing of the crops appropriate to its different portions, the economic difference between the climate of New Orleans and St. Paul is by no means to be measured by the difference of heat or rain-fall for the year at the two places. It is probable that the products of the soil per acre in Minnesota will be quite as valuable as the average products of any of the States bordering the river, though a higher culture may be required as we ascend northward.

Of the crops in the Mississippi Valley, Indian corn is common to the whole extent of it. In all the Northern States this matures in favorable seasons in from 100 to 120 days. Oats cover the next widest belt, their successful culture extending very nearly to the Gulf of Mexico. Irish potatoes come next. Commencing from the Gulf is a narrow belt of sugar lands extending north to lat 31°. The cotton belt extends from the Gulf to lat. 35°. At this parallel commences the cultivation of tobacco and hemp, which in the Mississippi Valley is confined chiefly to the States of Tennessee, Kentucky and Missouri. The cultivation of wheat, oats and potatoes extends far north into the British possessions. Throughout the whole

extent of the Valley of the Mississippi, forest trees, bearing witness to the excellence of the soil and climate, have a vigorous and thrifty growth and attain a large size. In all respects this great valley for its whole extent is wonderfully fitted for the abode of man.

The following table will show the elevation of different points of the upper portions of the basin of the Mississippi above, and their distances from, the Gulf of Mexico:

	Distance from the G. of Mexico.	Elevat'n above the G. of M.
	Miles.	Feet.
Summit of Dividing Ridge at the head of the Mississippi River.....	2,896	1,680
Itasca Lake.....	2,890	1,578
Cass Lake.....	2,755	1,402
Swan River.....	2,564	1,290
Mouth of Crow Wing River.....	2,380	1,130
Falls of St. Anthony.....	2,200	856
Mouth of Minnesota River.....	2,192	744
Height of Land at head of Big Sioux River.....		1,896
Coteau des Prairies.....		2,000
Devil's Lake.....		1,476
Coteau des Prairies du Missouri.....		2,096

MOUNTAINS OF NORTH CAROLINA.

It is not unknown among scientific men that the highest peak in the United States, east of the Rocky Mountains, is in the magnificent mountain scenery of North Carolina and East Tennessee, which may be called the Switzerland of the Atlantic States.

Heretofore, it has been supposed that Mount Mitchell, (named from the late Prof. Mitchell, of the University of N. C., who first measured its true altitude, as has been conclusively shown by Professor Charles Phillips, of the same institution,) is the highest peak. It is 6,711 feet high. It would, however, appear from the communication below, that there is a still higher peak in the great Smoky or Unaka range of mountains, on the line between North Carolina and Tennessee, near the head waters of the Oconaluftee and Little Pigeon rivers.

Messrs. Editors:

I have recently had letters from S. B. Buckley, Esq., giving me information of the results of recent explorations he has been making

among the mountains of North Carolina. Since the letters reached me, I have had the additional pleasure of a personal interview with Mr. Buckley, and now enclose the most important of the facts I have derived from him, in the hope that you will deem them worthy of preservation in your "Journal," as a contribution to the Physical Geography of the United States.

Very respectfully yours,

F. L. H.

New York, December 31, 1858.

Mount Le Conte—so named in honor of Prof. J. Le Conte, of Columbia, S. C. This is 6,670 feet high, situated three miles north of the gap of the road leading from the head waters of the Oconaluftee, in Jackson County, North Carolina, down those of the Little Pigeon to Sevierville, in Tennessee.

Safford's Peak—named thus in compliment to Prof. Safford, the State Geologist of Tennessee—is 6,559 feet high, and is at the east end of Mount Le Conte. These two are entirely in Tennessee.

Mount Guyot—so called from Prof. Guyot, of Princeton, who has also made measurements of some of these mountains. This elevation reaches to the height of 6,734 feet, and is on the state line, about twelve miles N. E. of Mount Le Conte.

Mount Henry—in honor of Prof. Henry, of the Smithsonian Institute. This is nearly one mile north of Mount Guyot, and is 6,425 feet high. All these are in the range of what are called the Smoky Mountains, and have never before had specific names bestowed on them.

Mount Buckley—so named by the associate of Mr. Buckley in his work. This is the highest peak yet measured; and both this and Mount Guyot are higher than Mount Mitchell. Mount Buckley, 6,755 feet high, is about twenty miles southwest of Mount Guyot. It is at the spot marked "Alpine," on the geological map of Tennessee, and the state line passes over its summit. This, so far as we now know, is the highest point in the United States, east of the Rocky Mountains.

Many other elevations were measured by Mr. Buckley, of which he furnished me with memoranda, of which I will not now speak. He has given me, however, some notes of the *Flora* of these mountains, which I subjoin.

These elevations, he remarks, very satisfactorily show why Western North Carolina and Eastern Tennessee have a northern climate though in a southern latitude. His observations also demonstrate that the highest mountains at the South are not the sources of the *largest* rivers.

He found the loftiest mountains covered with *Abies Nigra* and the *Abies Fraseri*; these are rarely found however below an elevation of 4,000 feet. The largest tree he met with in these mountains is the *Liriodendron Tulipifera*, called "tulip tree" in New England, and "poplar" in the South and West. He found trees varying in diameter from five feet to eleven feet.

The chestnut (*Castanea Americana*) also attains to great size, and retains an almost cylindrical trunk for fifty feet or more. In Haywood county, in one locality, three were found, the average diameter of which was ten feet.

The *White Oak*; this was found from sixteen to nineteen feet in circumference.

Abies Canadensis—the "spruce pine" of the South and hemlock of the North—is quite common, but rarely at an elevation of more than 4,000 feet. Its circumference, in some instances, is from 16 to 19 feet.

Abies Nigra.—The Black Spruce; it is called by the inhabitants *he-balsam*.

Abies Fraseri, called *she-balsam*, because it yields more balsam than the preceding. In the mountains of Haywood county it reaches a height of 100 feet, with a diameter at the base of three or four feet. It has been doubted whether this tree is to be found in New England; but Mr. Buckley has seen one from the White Mountains. The white pine of New England is found in the mountains of Haywood county, and is probably among the highest trees in that locality. Mr. Buckley saw one at least 150 feet in length; the usual diameter, however, rarely exceeded three feet. This is probably the southern limit of the white pine.

Magnolia, called the cucumber tree. This grows to an immense size. The largest seen had a circumference of 24 feet, and its usual diameter was from three to four feet.

Black Walnut.—This is not uncommon, and has been seen with a circumference of 16 feet. It is much used by cabinet makers.

Pinus Pungens.—This is a rare species of pine, remarkable for its singular and beautiful cone. Michaux saw a solitary specimen on Table Rock, near Morganton, and has described it. Mr. Buckley has supplied the Messrs. Parsons, of Flushing, L.I., with some of the seed.

The *Catalpa* is indigenous, and is found not only on the mountains, but also in other parts of the State.

The trees above mentioned will suggest to those acquainted with climatology, as indicated in the vegetable productions of a country, the existence of a winter climate in a part of North Carolina not unlike that of our more northern latitudes. In fact, there is no portion of the United States more salubrious than the mountains of North Carolina.

Supplementary to the above remarks by our respected contributor, we append in tabular form, a description, which we have obtained from another source, of the several mountains measured barometrically by Professor Buckley in 1858.

1. HIGHEST MOUNTAINS OF WESTERN NORTH CAROLINA.

	Feet.
<i>Cold Mountain</i> : near the forks of Pidgeon River, Haywood County.....	6,103
<i>Shining Rock</i> : a white quartz mountain five miles south of Cold Mountain.....	6,063
<i>Wilson's Balsam</i> : from four to six miles south of Shining Rock.....	6,270
<i>Mount Hargrove</i> : one mile west of Wilson's Balsam.....	6,156
<i>Devil's Court House</i> : south of, and connected with Wilson's Balsam.....	6,057
<i>Mount Hardy</i> : at the head of Tuckasee, French Broad and Pidgeon Rivers, and long supposed by many to be the highest mountain in the State.....	6,257
<i>Mount Lenoir</i> : ten miles north of Mount Hardy, at the head of Carey Fork, and near Balsam Spring—a rough balsam mountain.....	6,413

<i>Mount Cathey</i> : three miles north of Mount Lenoir.....	5,742
<i>Amos Plotts' Balsam</i> : near the head of Jonathan's Soco and Scott's Creeks....	6,406
<i>Mount Starling</i> : on the Cataluche Road..	6,456
<i>Mount Emmons</i> : or, Emmons' Balsam Mountain, south of Mount Starling....	6,465
<i>White Side Mountain</i>	5,076
From the top of White Side to the base of its precipice on its south side..	1,510
<i>Mount McDowell</i> : twelve miles northeast of White Side.....	5,106

2. HIGHEST PEAKS OF SMOKY MOUNTAIN.

On or near the line between N. Carolina and Tennessee.

<i>Mount Guyot</i> : Near the head of Ravensfork, a tributary of the Oconaluftee in Jackson County, North Carolina, and fifteen miles southwest from where Pidgeon River, enters Tennessee.....	6,734 ✓
<i>Mount Le Conte</i> : north of the road leading up Little Pidgeon River, over the mountains in North Carolina, and three miles from said road and near Alum Cave. It is entirely in Tennessee, and is probably the highest point of land in that State.....	6,670 ✓
<i>Peck's Peak</i> : three miles east of Mount Le Conte.....	6,338
<i>Mount Collins</i> : second peak of the highest peak.....	6,241
<i>Mount Mingus</i> : first peak north of the road above mentioned.....	5,779
<i>Buckley's Peak</i> : the highest of the Smoky Mountains near the head of Deep Creek and Noland's Creek, tributary to the Tuckasee in North Carolina and Little River in Tennessee, lying partly in Sevier County, Tennessee; and it is possible that a portion of it may be in Blount County, Tennessee. It is covered with fine balsam.....	6,755 ✓
Mount Washington, as reported by Joel W. Andrews, in the Report of the Regents of the University in New York, for 1855, is elevated 6,496 feet above the sea. Hitherto its height has been variously stated at 6,526 feet (Lippincott's Gazetteer) and 6,428 feet, (Fisher's Gazetteer.)	

[Communicated.]

THE PROPOSED NEW TERRITORIES—AN IMPORTANT INQUIRY IN REFERENCE TO THEM.

As general attention is now directed to the proposed territories of Colona, (?) Laramie, Ne-

vada and Arizona, on account of their well-known mineral wealth, the extent of their agricultural capacities becomes an interesting subject of inquiry.

Thus far, all authorities concur in representing the immense area out of which these new territories are to be erected, as well as New Mexico and Utah, to be comparatively a *rainless* region, in which no crops can be grown, except by irrigation. Should this prove to be the case, their future value and importance must be much less than is generally anticipated.

There will undoubtedly be a very large emigration, on the opening of the season, to the gold fields recently discovered in the vicinity of Pike's Peak. Can food be raised for it in the vicinity of the mines? The wild animals that now contribute largely to the support of the miners will soon disappear. The country is probably well-adapted to grazing, but something else is required for a large and prosperous State. There are, undoubtedly, tracts of bottom lands, that can be irrigated, but not of sufficient area to sustain a large population.

Only a very small amount of rain falls upon any of the plains that skirt the eastern and southern base of the Rocky Mountains, or upon the plains that lie between these and the Sierra Nevada range. The lofty summits of both condense the small amount of moisture carried inland from the sea. Upon these there is a considerable deposit of moisture. They are the source of all the rivers in the territories described. Does the rain descend their slopes sufficiently far as to fall in quantity upon arable lands? What little that can be collected upon this point shows that it does not. Mr. Graham, the recently elected delegate to Congress from Colona, states, in a letter describing that country, that no rain falls there after June.

The subject of this inquiry is an important one, and these remarks are designed to invite communications in reference to the meteorology of all that portion of the continent east of the Sierra Nevada and Cascade ranges of mountains, and west of the 99th meridian from Greenwich.

P.

DEPARTMENT OF STATISTICS.

INDIA: ITS EXTENT AND POPULATION.

I.—BENGAL PRESIDENCY—

a. Under the Governor General in Council :

Area: sq.m. Populat'n.

1. Punjab—viz., Lahore, Jholum, Moulton, Leia, Peshawur, Jullunder...	73,535	10,435,710
2. Cis-Sutlej States.....	8,090	2,282,111
3. Oude.....	25,000	5,000,000
4. Nagpore or Berar....	76,432	4,650,000
5. Pegu.....	32,250	570,180
6. Tonasserim Provinces.	29,168	115,431
7. Eastern Straits Settlements, Singapore, etc.	1,575	202,540
Total.....	246,050	23,255,972

b. Under Lt.-Governor of Bengal :

1. Regulation Provinces—viz., Patna, Bhagulpore, Moorsheadabad, Dacca, Jessore, Sunderbunds, Chittagong, Cuttack.....	126,133	37,262,163
2. Non-Regulation Provinces—viz., Assam, Cachar, Territory resumed from Toola Ram Senahputter, S.W. Frontier, Arracan.....	95,836	3,590,234
Total.....	221,969	40,852,397

c. Under Lt.-Gov. of N.W. Provinces :

1. Regulation Provinces,—viz., Delhi, Meerut, Rohilkund, Agra, Allahabad, Benares.....	72,052	30,271,885
2. Non-Regulation Provinces—viz., Kumaon and Ghurwal, Jaunsar and Bawar, Dehra Dhoon, Khote Kasim, Bhutty Territory, Jalam and Jansi, Ajmere, British Mhainwarrah, Saugor and Nerbudda, British Nimaur.....	33,707	3,383,308
Total.....	105,759	33,655,193

Total Bengal Presidency. 573,778 97,763,562

II.—MADRAS PRESIDENCY—Under Lt.-Gov. of Madras:

1. Regulation Provinces,—viz., Rajahmundry, Masulipatam, Gunttoor, Kurnoul, Cudapah, Nellore, Bellary, N. Arcot, S. Arcot, Chingleput, Madras City, Salem, Coimbatore, Canara, Malabar, Trichinopoly, Tanjore, Madura, Tinnivelly..	119,526	20,120,495
2. Non-Regulation Provinces—viz., Ganjam, Visagapatam, Coorg..	12,564	2,316,802

Total Madras Presidency. 132,090 22,437,297

III.—BOMBAY PRESIDENCY—Under Lt.-Gov. of Bombay:

1. Bombay—viz., Ahmedabad, Kaira, Broach, Surat, Tannah, Candesh, Bombay and Colaba Islands (incl. C. of Bombay), Poonah, Ahmednuggur, Sholapur, Rutnagherry, Belgaum, Dharwar.....	57,723	9,015,534
2. Sattara.....	10,222	1,005,771
3. Sinde—viz., Shikarpoor, Frontier Districts, Hyderabad, Kurrachee, Thur and Packur....	63,599	1,768,737

Total Bombay Presidency. 131,544 11,790,042

Total of three Presidencies.. 837,412 131,990,901

IV.—NATIVE STATES—Under British protection:

a. Subordinate to Bengal:		
1. Gwalior (Scindia's Dominions).....	33,119	3,228,512
2. Golab Sing's Dom'ns.	60,000	3,000,000
3. Hyderabad (Nizam's Dominions).....	95,337	10,666,080
4. Indore (Holkar's Dominions).....	8,318	815,164
5. Nepaul.....	54,500	1,940,000
6. Rajpoot States.....	114,393	7,412,426
7. Saugor and Nerbudda Territories.....	12,452	1,580,394
8. Sikh Protected States.	7,366	1,894,800
9. Other States.....	130,050	8,164,840
Total.....	515,535	38,702,206

b. Subordinate to Madras:		
1. Mysore.....	30,886	3,460,696
2. Travancore.....	4,729	1,011,824
3. Other States.....	16,194	741,151

Total..... 51,809 5,213,671

c. Subordinate to Bombay:		
1. Cutch.....	6,764	500,536
2. Kattywar Petty Chiefships.....	19,850	1,468,900
3. Kolapure.....	3,445	500,000
4. Other States.....	30,516	2,000,934

Total..... 60,575 4,460,370

Total Protected States... 627,919 48,376,247

Total of British and Protected India..... } 1,465,331 180,367,148

V.—FRENCH POSSESSIONS:

1. Chandernagore.....	4	31,396
2. Karical.....	63	59,872
3. Mahe.....	2	3,419
4. Pondicherry.....	107	96,712
5. Yanam.....	13	6,464

Total of French India. 189 197,863

VI.—PORTUGUESE POSSESSIONS:

1. Goa, Salcette, Bardes,	1,458	363,788
2. Damaon.....	83	33,950
3. Diu.....	12	10,658

Total Portuguese India. 1,553 408,596

VII.—INDEPENDENT NATIVE STATES:

1. Bhotan.....	34,506	1,812,000
2. Nepaul.....	35,208	1,880,000

Total Independent India. 69,714 3,692,000

RECAPITULATION.

BRITISH INDIAN EMPIRE:

Bengal Presidency.....	573,778	97,763,562
Madras Presidency.....	132,090	22,437,297
Bombay Presidency.....	131,544	11,790,042

NATIVE STATES SUBORDINATE TO THE BRITISH:

Under Bengal.....	515,535	38,702,206
Under Madras.....	51,809	5,213,671
Under Bombay.....	60,575	4,460,370

Total British India.....	1,465,331	180,367,148
French Indian Possessions.....	189	197,863
Portuguese Indian Possessions..	1,553	408,596
Independent Native States.....	69,714	3,692,000

Total of India.....	1,536,787	184,665,607
Deduct Pegu, the Tenasserim Provinces, and the Eastern Straits Settlements in Further India, dependent on Bengal.....	62,993	888,151

Total in Hindoestan..... 1,503,794 183,777,456

The table appearing above, has been compiled from the returns of 1856, and with the intention of exhibiting in a concise form the political divisions of the great middle peninsula of Asia and its dependencies, chiefly those portions composing the British Indian Empire as now organized, and which has recently been erected into a royal government under the immediate sovereignty of the Queen of England. It exhibits also the extent and population of the French and Portuguese Possessions—small, indeed, but valuable as trading stations; and also the extent and population of the states which still retain their nominal independence. Until lately, the Danes held Tranquebar and Serampore, the first on the Coromandel coast and the latter in Bengal: these were purchased by the British.

The recent transfer of the Government of India from the East India Company to the Crown, did not change the political subdivisions of the country.

STATISTICS OF AMERICAN STATES.

NO. 1.

REPUBLIC OF ECUADOR.

Lat. 1° 40' N. to 5° 50' S. | Populat'n (1858) 1,308,042
 Long. 68° 35' to 81° 20' W | Density, 6.51 to sq. mile.
 Area, 206,692* sq. miles | Capital, Quito.

CONSTITUTION.

Executive.—President and Vice-President, elected by the people through electoral colleges, for four years. President's salary \$12,000 per annum.

Administration.—1. Minister of Interior and Foreign Affairs; 2. Minister of Finance, and 3. Minister of War and Marine.

Council of Government.—All the ministers, a judge of the Supreme Court, and an ecclesiastic. The Vice-President of the Republic is President of the Council.

Legislature.—A Senate of 18 members, 6 from each district, and a House of Representatives of 30 members, 10 from each district. Senators are elected for 6 years, and representatives for 2 years. Assembles annually at the capital on the 15th September.

Judiciary.—A Supreme Court of Appeals at Quito; Superior Courts at Quito, Guayaquil and Cuenca, capitals of districts; and Provincial Courts at Quito, Ibarra, Tacunga, Riobamba, Esmeraldas, Santa Rosa, Guayaquil, Porto Viejo, Cuenca and Loja, capitals of provinces. At Guayaquil there is also a Commercial Court.

National Religion.—The Holy Apostolic Roman Catholic. The Church is under the superintendence of the Archbishop of Quito and the Bishops of Guayaquil and Cuenca, and has 20 prebendaries, 2 vicars-general, 27 vicars, 276 parish priests, etc.

HEIGHTS OF THE ECUADORIAN ANDES.

Eastern Cordillera.		Western Cordillera.	
Peaks.	Feet.	Peaks.	Feet.
Cayambe	19,813	Chimborazo	21,371
Antisana	19,307	Iliniza	17,649
Cotopaxi	19,162	Casalagua	16,864
Llanganate	18,639	Cotacachi	16,651
Altar	18,639	Pichincha	16,213
Sincholagua	17,473	Corazon	16,169
Sangai	17,284	Atacasho	16,169
Collanes	17,284	Chiles	15,952
Sara-Urcu	17,276	Carahuirazo	15,916
Tunguragua	16,514	Yana-Urcu	15,913
Azuay	15,749	Quilindana	15,913

RIVERS OF ECUADOR.

1. *Emptying into the Amazon*—Napó, Santiago, Morona, Chinchipe, Tigre, Nanay.

* Including the Gallapagos Islands, which constitute a canton of Quito.

2. *Emptying into the Ocean*—Mira, Esmeraldas, Guayaquil, Santiago, Jubones, Naranjal, Charapoto, Chones, Tumbes.

POPULATION OF PROVINCES.

Provinces.	Cantons.	Parishes.	Populat'n.
I. DISTRICT OF QUITO:			
1. Pichincha	1	39	154,081
2. Imbabura	4	32	130,494
3. Leon	4	36	221,820
4. Chimborazo	4	44	197,105
5. Esmeraldas	1	5	9,183
6. Oriente	3	7	19,385
II. DISTRICT OF GUAYAS:			
7. Guayaquil	9	33	92,696
8. Manavi	4	12	39,851
III. DISTRICT OF AZUAY:			
9. Cuenca	3	43	171,300
10. Loja	2	26	72,159
Total, 1858	35	277	1,108,042

Classification.

Europeans and Creoles	601,219
Civilized Indians	462,400
Mestizos and Sambos	36,692
Negroes, pure	7,831

Sexes.

Males	575,496
Females	592,586

Former Census Returns.

1826	555,700	1846	869,692
1836	706,320	1856	1,086,981

Add to each census 200 000 for uncivilized Indians.

CAPITALS OF PROVINCES.

1. Quito, 80,000; 2. Ibarra 13,000; 3. Tacunga, 16,000; Riobamba, 16,000; 5. Esmeraldas, 600; 6. Santa Rosa, 150; 7. Guayaquil, 22,000; 8. Porto Viejo, 1,000; 9. Cuenca, 25,000; 10. Loja or Loxa, 12,000.

PUBLIC INSTRUCTION.

Classification of Schools.	Number.	Scholars.
Primary for Males	260	9,249
Academies do	3	
Primary for Females	30	2,783
Seminary do	1	
Special and professional	8	1,299
University at Quito	1	
National Colleges	6	
Mixed College	1	13,331
Total	310	

—Distributed to the provinces, thus:

Pichincha	2,928, or 1.9 per cent.
Imbabura	1,535, or 1.2 "
Leon	1,753, or 0.8 "
Chimborazo	923, or 0.2 "
Esmeraldas	80, or 0.9 "
Oriente	114, or 0.6 "
Guayaquil	1,926, or 2.1 "
Manavi	443, or 1.1 "
Cuenca	1,929, or 1.2 "
Loja	900, or 1.2 "

NATIONAL FORCES.

Army.—General Staff, 296; Artillery (one brigade) 190; Infantry (two battalions), 380; Column of Pichincha, 135; Column of Babay-hoya, 135; Lancers (First Squadron), 120; Lancers of Taura, 120; Lancers, (Second Squadron), 70; Police, (one company), 50.—total, 1,496.

Navy.—Steamers, "Machala" and "Guayas," and mailboat "Olmeda."

PUBLIC FINANCE.

1854-5.. Receipts.....	\$1,310,383
Expenditures.....	1,728,319
1855-6.. Receipts.....	1,372,800
Expenditures.....	1,358,498

PUBLIC DEBT.

Foreign.....	£1,824,000, or \$9,120,000
Interior.....	4,293,314

Total Debt.....\$13,493,314

COMMERCE, 1855-6.

Exports from Guayaquil:	
Silver (plata sellada).....	\$42,022
Gold, (oro sellada).....	25,540
Merchandise.....	2,187,131

Total.....2,254,693

Exports from Manta—Merchandise.....	\$78,448
" to New Granada, by land.....	300,000
" " Peru, by land.....	100,000

Total Exports.....	\$2,723,141
" " 1854-5.....	2,119,648

Imports into Guayaquil.....	\$2,374,439
" " Manavi.....	112,267
" from New Granada by land.....	40,000
" from Peru, by land.....	100,000

Total Imports 1855-6.....	\$2,626,706
" " 1854-5.....	1,914,645

QUANTITY OF EXPORTS.

Articles.	Guayaquil.	Manta.
Cacao, cargass.....	164,093	1,956
Sombreros, dozen.....	35,504	3,090
Alfajias.....	8,229	....
Manyles, pieces.....	8,215	....
Zuelas.....	24,267	....
Pita, lbs.....	13,753	6,217
Tamarinds, qtls.....	925	....
Tobacco.....	3,795	38
Cascarilla ".....	7,006	....
Sarsaparilla ".....	684	....
Liken (<i>Orchilla</i>).....	2,151	....
Canas, No.....	80,861	....
Coffee, qtls.....	1,021	....
Lena (<i>wood</i>) lbs.....	603,868	....
Caucho (<i>india rubber</i>) qtls..	1,609	732
Hamacas.....	287	....
Bayeta, varas.....	12,091	....

Articles.	Guayaquil.	Manta.
Pellones (<i>fruit</i>) cargass.....	435	....
Aquardiente, botijas.....	317	....
Chocolate, arrobas.....	....	248
Manteca Cacao, lbs.....	....	570
Almidon (<i>starch</i>) arrobas....	....	10
Pita floja.....	....	1,900

COCOA EXPORTED FROM GUAYAQUIL.

1847.....lbs.	12,673,613	1852.....lbs.	13,965,548
1848.....	21,007,565	1853.....	13,243,024
1849.....	14,234,734	1854.....	10,993,141
1850.....	11,066,056	1855.....	15,089,755
1851.....	9,567,068	1856.....	13,276,608

COMMERCE WITH UNITED STATES.

(From the U. S. Commerce and Navigation Tables.)

	Value of Exports.		Value of Imports.
	Domestic.	Foreign.	Total.
1850.....	\$24,414	\$10,511	\$34,925
1851.....	....	....	....
1852.....	....	....	70,585
1853.....	....	....	12,600
1854.....	....	....	57,534
1855.....	66,092	....	66,099
1856.....	27,374	2,066	29,440
1857.....	34,546	2,630	37,176

The port of Guayaquil and those of Manta and San Lorenzo are open to general commerce; and the ports of Santa Elena, Callao, Bahia de Caracas, Loja and Ibarra for the exportation of national produce only. Guayaquil is the only port of general deposit for re-exportation to foreign ports.

The duties on navigation in the ports of Ecuador are—tonnage dues, 25 cents per ton; light dues, $6\frac{1}{4}$ cents per ton; and pilot fees (when a pilot is employed) \$2 50 per foot of the vessel's depth.

For Tariff, see Commercial Relations, vol. 2.

WEIGHTS, MEASURES, AND MONEYS.

Weights.—1 libra=(460.1 grammes or 1.0144 lb. avoirdupois)=2 marcos=16 onzas=128 ochavas=256 adarmes=768 tomines=9,216 granos=2,000 lbs.=80 arrobas=20 quintales=1 tonelada. The carga=81 libras.

Measures—Liquid Capacity.—1 cantara (=16.07 litres or 4.24 gallon)=4 quartillas=8 azumbres=32 quartillos=128 copa.

Dry Capacity.—1 cahiz (=563 litres or 19.2 bushels)=12 fanegas=144 almudes=288 medios=376 quartillos.

Length.—1 vara (=0.8475 metre or 0.93 yard)=3 pies=4 palmos=36 pulgadas=48 dedos=432 lineas=5,184 puntas. The estadal=4 varas.

Itinerary.—1 legua=8,000 varas.

Agrarian.—1 yugada = 50 fanegadas = 600 celemines = 28,800 square estadales = 460,800 square varas.

Moneys.—On the Spanish basis, and in pieces as follows:

Gold.—The onza and half onza, the doblon [$\frac{1}{4}$] and escuda [$\frac{1}{16}$]: the doblon=\$16 in silver.

Silver.—The peso fuerto or dollar and its half and quarter; also the peseta of two reals, and the real and its half and quarter.

By decree of December 5, 1856, the metrical system of France was legalized and adopted as the national standard of weights, measures and moneys. The new coinage was to be in part issued on the 15th of October, 1858. The peso fuerto or hard dollar will, hereafter, be equivalent to the five franc piece of France and its subdivisions in proportion.

MISCELLANEOUS STATISTICS.

POPULATION OF CANADA.

The following table exhibits the progress of population in Canada for the 10 years ending with 1857:

	Lower Canada.	Upper Canada.	Total.
1848.....	768,835	723,087	1,491,922
1851.....	890,261	952,004	1,842,265
1857.....	1,220,514	1,305,923	2,526,437

Increase in 10 years.	451,679	582,836	1,034,515
Rates of inc. per cent.	58.7	80.6	69.8

—The area of Lower Canada is 210,020, and of Upper Canada 121,280 square miles. Hence the density of population in the first is 5.8 and the latter 10.7 to the square mile. It must, however, be remarked that less than one-sixth of the whole area of Lower Canada is yet occupied, and but little more than one-fourth of that of Upper Canada; and hence the population in the settled portions of the country is in reality on a corresponding multiple the more dense.

POPULATION OF NEWFOUNDLAND.

A census taken in 1858 states the population at 119,334. According to the census of 1845 it contained 96,295 inhabitants; and an official estimate made in 1851 stated the number at 101,600. Of the population in 1858, 55,152 were Roman Catholics, 42,859 Church of England, 20,142 Methodist, 302 Scotch Presbyterian, 520 Scotch Free Church, 347 Congregationalist, and 44 Baptist.

ARKANSAS.

The progress of Arkansas since 1850 is exhibited in the following comparison of the census returns of 1850, 1854, and 1858:

	1850.	1854.	1858.
White Persons.....	162,189	199,224	244,310
Free Colored Persons..	608	614	734
Slaves.....	47,100	60,279	80,355
Total population....	209,897	260,117	325,429
Lands cultivated, acres.	781,530	875,180	1,298,034
Cotton produced, bales.	65,344	160,779	172,651
Corn, bushels.....	3,893,939	11,536,969	16,880,952
Wheat, bushels.....	199,639	332,535	1,139,076
Oats, bushels.....	656,283	1,040,206	2,035,700

Value of taxable property.....\$35,428,675 55,377,384 99,873,248
—Included in the taxable property in 1858 were 360 saw mills, 104 tan yards, 56 distilleries, 2,212 pleasure carriages, 64,198 horses, 23,108 mules, 1,001 jacks and jennies, and 191,692 neat cattle.

TAXABLE PROPERTY IN OHIO.

The development of this State is well marked in the increased value of taxable property. In 1825 the amount assessed was only \$59,525,336, and up to 1840 it was only \$128,553,657. Its increase from the latter period, quinquennially, has been as follows:

Years.	Real Estate.	Personal Prop'y.	Total.
1840.....	\$100,851,837	\$27,502,820	\$128,553,657
1845.....	106,185,744	35,984,725	144,160,469
1850.....	341,388,539	98,487,502	439,966,340
1855.....	578,858,539	283,018,815	860,877,354
1857.....	585,620,702	263,793,897	849,414,599

BRAZIL AT THE END OF 1857.

The commerce of this Empire for the year ending December 31, 1857, was as follows:

	Imports.	Exports.	Total.
England and Possessions..	£8,190,116	£3,954,128	£12,144,244
France and possessions...	1,830,674	1,058,611	2,889,285
United States..	864,155	3,516,079	4,380,234
Other countries.....	2,876,828	4,193,783	7,070,611

Total.....£13,761,773 £12,722,601 £26,484,374

The Brazilian Debt of the same date amounted to £12,970,500, namely—foreign debt £5,345,500, (originally £6,639,800), internal debt £6,100,000, and the new Railroad loan, £1,525,000.

The Revenue of the Empire for the year ending June 30, 1857, amounted to £5,486,211. The average revenue for the three years then ending had been £4,592,333 a year. A balance of £1,744,135 remained in the Treasury.

The above returns refer to the Empire at large. Each province, however, has its own

resources and revenues, and the finances of the leading ones are in an equally flourishing condition, several have expended large sums in the construction of public works.

In calculating the values in sterling, the milrea of Brazil has been valued at 27 pence or 54 cents.

EDUCATION IN UPPER CANADA.

	1842.	1847.	1852.	1856.
Children, [5 to 16], of school age.....	141,143	230,975	262,755	324,888
Colleges and Universities..	5	6	8	12
County gr'mmar schools and academies....	25	22	74	89
N'r'm'l and Model schools.....	...	2	3	3
Private schools.....	44	96	167	239
Common schools	1,721	2,727	3,010	3,472
Total scholastic institutions ..	1,795	2,863	3,258	3,815
Of which were free schools.....	....	....	901	1,263
Students in Colleges, &c.....	....	700	751	1,335
Pupils in gram-mar schools, &c.....	....	1,000	3,194	4,393
Pupils in private schools.....	....	1,831	5,133	5,213
Pupils in N'r'mal and Model schools.....	....	....	645	772
Pupils in Common schools..	65,978	124,829	179,587	251,145
Total at School.	65,978	131,300	189,310	262,858
Teachers of c'mmon sch'ls. ....	....	3,028	3,388	3,689
Teachers — males.....	....	2,365	2,541	2,622
Teachers — females.....	....	663	847	1,067
Salaries of common school teachers.....	£41,500	£77,599	£107,237	£194,920
Funds available for common school houses, libraries, apparatus, etc..	...	....	25,094	74,607
Amount received by other institutions.....	....	....	36,989	62,221
Total available for educational purposes...	....	£176,094	£156,192	....
Average months taught.....	....	8.3	9.5	10

GOLD YIELD OF VICTORIA.

The shipments of Gold from Melbourne, since the first discovery of the Victoria gold Mines in 1857, to the end of the first week of September, 1858, have been as follows :

	1851.	1852.	1853.	1854.	1855.	1856.	1857.	1858.
Yearly.....	145,146	1,974,975	2,497,723	2,144,699	2,576,745	3,003,811	2,729,655	....
Monthly Aver.	145,146	164,581	208,143	178,726	214,729	260,317	227,471	....
January.....	1851.	1852.	1853.	1854.	1855.	1856.	1857.	1858.
February.....	1851.	1852.	1853.	1854.	1855.	1856.	1857.	1858.
March.....	1851.	1852.	1853.	1854.	1855.	1856.	1857.	1858.
April.....	1851.	1852.	1853.	1854.	1855.	1856.	1857.	1858.
May.....	1851.	1852.	1853.	1854.	1855.	1856.	1857.	1858.
June.....	1851.	1852.	1853.	1854.	1855.	1856.	1857.	1858.
July.....	1851.	1852.	1853.	1854.	1855.	1856.	1857.	1858.
August.....	1851.	1852.	1853.	1854.	1855.	1856.	1857.	1858.
September.....	1851.	1852.	1853.	1854.	1855.	1856.	1857.	1858.
October.....	1851.	1852.	1853.	1854.	1855.	1856.	1857.	1858.
November.....	1851.	1852.	1853.	1854.	1855.	1856.	1857.	1858.
December.....	1851.	1852.	1853.	1854.	1855.	1856.	1857.	1858.

THE AUSTRALIAN COLONIES.

In order to convey an idea of the progress the group of Australian colonies has made in population, we present the following comparison between that of 1851 and 1857.

Classes.	1851.	1857.	Increase.
Victoria.....	77,345	463,135	385,790
New South Wales....	197,168	305,487	108,319
South Australia.....	66,538	109,917	43,379
West Australia.....	5,886	10,000	4,114
Tasmania.....	70,136	100,000	29,864
New Zealand.....	26,656	50,000	23,344
Total.....	443,729	1,038,539	594,810

CANALS IN THE UNITED STATES IN OPERATION.

The following tabular statement will show the total number of miles of Canals in the United States—embracing rivers made navigable by locks and for purposes of navigation—in use on the first day of January, 1859 :

Maine	50.50
New Hampshire	2.13
Vermont	1.06
Massachusetts	6.60
New York	1039.06
New Jersey	148.70
Pennsylvania	1349.00
Delaware	13.50
Maryland	191.00
Virginia	188.98
North Carolina	13.50
South Carolina	52.50
Georgia	28.00
Louisiana	24.75
Kentucky	496.50
Illinois	102.95
Wisconsin	50.00
Michigan .....	.75
Indiana	543.09
Ohio	799.00
Total	5088.33

The cost of all the Canals is not well ascertained. It will not vary far from \$175,000,000. Several of them perform most important functions both in the local and general trade of the country. They are among the most important carriers of coal, while the Erie canal is the grand avenue for the internal trade of the country.

There are a very large number of Canals in California, having an aggregate mileage of several thousands of miles, but these are exclusively used for mining purposes.

RAILROADS OF THE UNITED STATES, COMPLETED AND PROGRESSING,

With the cost of road and equipment to the end of the year 1858 :

State, &c. .	Total length.	Length open.	Cost of roads, &c.
Maine	631.4	554.9	\$19,345,567
New Hampshire	594.8	560.5	19,037,556
Vermont	557.5	537.9	21,235,184
Massachusetts	1490.9	1378.1	63,646,030
Rhode Island	86.9	63.6	2,750,450
Connecticut	609.5	654.4	25,098,678
New Eng. States. .	4161.0	3749.4	\$151,163,435

State, &c.	Total length.	Length open.	Cost of roads, &c.
New York	3476.4	2695.3	\$135,314,197
New Jersey	645.6	553.6	24,856,531
Pennsylvania	3735.5	2971.1	140,510,271
Delaware	119.6	91.7	1,980,665
Maryland	873.8	792.3	46,116,556
Mid. Atlantic States. .	8850.9	7104.0	348,808,219
Virginia	1776.7	1410.7	42,670,674
North Carolina	836.1	760.1	12,899,423
South Carolina	1077.8	779.8	18,431,550
Georgia	1554.0	1177.0	24,297,712
Florida	730.5	198.3	4,675,000
South Atlantic States. .	5965.1	4325.9	102,973,359
Alabama	1504.4	679.3	19,972,038
Mississippi	371.9	246.6	7,998,298
Louisiana	1039.0	393.0	14,297,801
Texas	2229.0	205.5	5,000,000
Gulf States	5144.3	1524.4	47,268,137
Arkansas	701.3	38.5	1,093,161
Missouri	1164.3	547.2	30,871,360
Tennessee	1511.9	1035.1	26,337,427
Kentucky	724.7	399.8	13,314,059
South Interior States .	4102.2	2320.6	71,616,007
Ohio	4278.2	2968.1	124,821,055
Michigan	1627.8	1032.0	36,392,812
Indiana	1692.9	1290.9	31,055,603
Illinois	3177.4	2714.4	94,338,008
Wisconsin	2403.7	822.2	36,742,063
Iowa	1785.0	343.8	11,260,169
Minnesota	1058.0	..	500,000
North Interior States. .	16023.0	9191.4	335,109,701
California	170.7	22.5	1,547,100
Total United States. .	44417.2	28238.2	1,058,485,958

ACTUAL MILEAGE IN EACH STATE.

States, etc.	Miles.	States, etc.	Miles.
Maine	486.2	Alabama	581.8
New Hampshire	553.0	Mississippi	604.1
Vermont	557.6	Louisiana	281.0
Massachusetts	1327.8	Texas	205.5
Rhode Island	101.1	Gulf States	1672.4
Connecticut	601.8	Arkansas	38.5
N. England States. .	3727.5	Missouri	547.2
New York	2726.2	Tennessee	875.8
New Jersey	553.6	Kentucky	498.3
Pennsylvania	2678.1	S. Interior States. .	1959.8
Delaware	114.7	Ohio	2978.6
Maryland	453.8	Michigan	777.0
Mid. Atl'c. States. .	6527.4	Indiana	1939.4
Dist. of Columbia. .	2.5	Illinois	2774.4
Virginia	1642.7	Wisconsin	837.2
North Carolina	693.1	Iowa	343.8
South Carolina	872.8	Minnesota .....	..
Georgia	1178.8	N. Interior States. .	9750.4
Florida	198.3	California	22.5
S. Atlantic States. .	4588.2	Total, United States. .	28,238.2

RAILROADS AT QUINQUENNIAL PERIODS.						
States.	1829.	'34.	'39.	'44.	'49.	'54.
Maine.....	..	..	12	64	87	407
N. Hamp'e ..	..	..	..	3	134	649
Vermont.....	..	..	..	..	93	516
Mass'ts... 3	3	144	465	948	1,306	1,328
R. Island.. ..	..	..	50	50	50	101
Connect't.. ..	..	..	36	238	326	591
<hr/>						
N.England 3	3	242	820	1,638	3,519	3,728
New York.. ..	39	325	722	953	2,393	2,726
N. Jersey.. ..	77	124	186	195	411	554
Pennsylv'a 25	318	562	893	981	1,627	2,678
Delaware.. ..	16	16	16	16	49	114
Maryland.. ..	88	181	254	324	412	454
Dis. of Co- lumbia.. ..	..	..	..	3	3	3
<hr/>						
Md'e States 25	538	1,208	2,074	2,472	4,896	6,530
Virginia.. ..	93	125	223	303	1,122	1,643
N. Carolina ..	..	..	57	154	403	693
S. Carolina ..	137	137	204	204	754	873
Georgia	100	452	609	971	1,179
Florida	24	26	198
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S. Atl. States..	230	362	966	1,324	3,276	4,585
Alabama	46	46	46	113	302	582
Mississippi	26	60	159	604
Louisiana	40	40	40	66	172	281
Texas .. ..	..	..	..	..	32	205
<hr/>						
Gulf States ..	86	86	112	239	665	1,672
Arkansas	38
Missouri	37	547
Tennessee	317	876
Kentucky	15	25	28	28	122	498
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S.W. States ..	15	25	28	28	476	1,959
Ohio	84	274	2,394	2,978
Indiana	86	1,482	1,939
Illinois	22	22	1,692	2,774
Michigan .. ..	..	..	206	270	527	777
Wisconsin .. ..	..	..	..	..	195	837
Iowa .. ..	..	..	..	..	37	344
<hr/>						
N.W. States ..	..	..	312	652	6,307	9,750
California .. ..	..	..	..	..	..	22
<hr/>						
U. States.. 28	872	1,923	4,312	6,353	19,138	28,238

ANNUAL MILEAGE OF RAILROADS.			
Years.	Miles.	Year.	Miles.
1828	3	1844	4,312
1829	28	1845	4,670
1830	41	1846	4,836
1831	54	1847	5,282
1832	131	1848	5,679
1833	576	1849	6,353
1834	872	1850	7,312
1835	988	1851	9,090
1836	1,102	1852	11,631
1837	1,412	1853	13,379
1838	1,843	1854	19,138
1839	1,923	1855	21,069
1840	2,167	1856	23,761
1841	3,319	1857	25,966
1842	3,877	1858	28,238
1843	4,174		

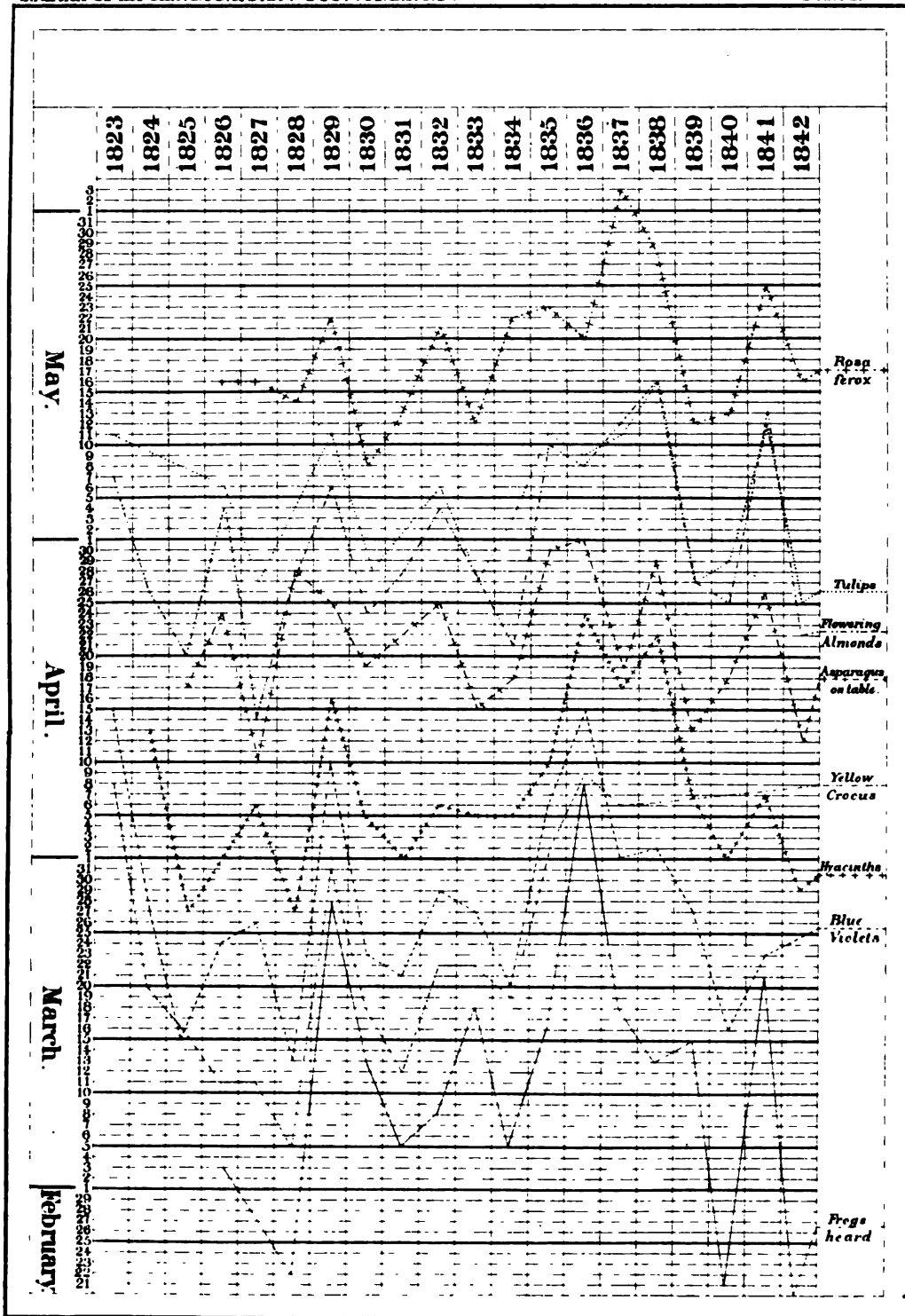
ANNUAL INCREASE OF MILEAGE.			
1829	25	1844	138
1830	13	1845	358
1831	13	1846	160
1832	77	1847	446
1833	445	1848	397
1834	296	1849	674
1835	116	1850	969
1836	114	1851	1,778
1837	310	1852	2,541
1838	431	1853	1,748
1839	80	1854	5,759
1840	244	1855	1,931
1841	1,142	1856	2,692
1842	558	1857	2,205
1843	297	1858	2,272
<hr/>			
Total	28,238		

METEOROLOGICAL REPORTS.

The following extracts are from the private journal of a lady of remarkably accurate habits and especially careful in her observations. They give the dates of the various indications of Spring, in consecutive series, for twenty years from 1823 to 1842. The observations were made in every instance upon the same plants growing in the same position, and under the same circumstances. They present an interesting illustration of the manner in which almost every one may, some way or another, advance the cause of science; and how, without scientific arrangement, a valuable amount of information can be extracted from the data obtained. The place of observation was upon the banks of the Passaic, New-Jersey, on tide water—lat. 40° 48'; long. 74° 8'.

We have condensed the observations into into tabular form to show the way in which such observations can be best rendered of interest, and the deductions made most apparent. By reference to the table, it will be readily seen how much greater the variation from season to season is in the advent of the early harbingers of Spring, than in those that come later, there being a difference of forty-eight days in the appearance of frogs, while there is only sixteen days difference in the blooming of tulips.

Notes of similar observations, showing the dates of first, and killing frosts, in the fall, would be of great interest.



Drawn by Geo. Schroter

Lith by C. F. F. 216 William Street New York.

DEPARTMENT OF PUBLICATIONS.

(Books for Notice must be sent early in the Month.)

BOOKS, ATLASES, AND MAPS RECEIVED.

Colton's Illustrated Cabinet Atlas and Descriptive Geography.—Maps and plans (113)—by George Woolworth Colton; and text, (pp. 400)—by Richard Swainson Fisher. New York: J. H. Colton, No. 172 William street. 1 vol., royal 4to. With 652 illustrations. (Presented by the Publisher.)

Report on the Currency.—By a Committee of the Friends of Sound Currency (Hon. Geo. Opdyke, Chairman), and presented at their meeting in the Mercantile Library, on the 19th November, 1858. 8vo, pp. 32. (Presented by J. Smith Homans, Esq., Editor of the Bankers' Magazine.)

Collisions at Sea; the report of a Committee of the New York Chamber of Commerce in relation to, May 13, 1858. 8vo, pp. 49. (Presented by J. Smith Homans, Esq.)

Statistics of Ohio.—Annual Report of the Commissioner of Statistics to the General Assembly of Ohio, for the year 1857. By Edward D. Mansfield, Commissioner of Statistics. Columbus. 1858. 8vo, pp. 112. (Presented by the author.)

Bankers' Magazine.—Edited by J. Smith Homans, Corresponding Secretary of the Chamber of Commerce of the State of New York. Twelfth volume (containing monthly numbers). 1857–58. New York, No. 162 Pearl street. 8vo, pp. 1,000. (Presented by the editor.)

Baltimore and Ohio Railroad.—Thirty-second Annual Report of the President and Directors to the Stockholders of the Baltimore and Ohio Railroad for the year 1858. Baltimore, 1858. 8vo, pp. 160. (Presented by J. Smith Homans, Esq., Editor of Bankers' Magazine.)

Chamber of Commerce.—Report of a Committee of the Chamber of Commerce of New York on Canal Navigation by Steam. New York, 1858, 8vo, pp. 84. (Presented by J. Smith Homans, Esq., Editor of the Bankers' Magazine.)

Mexico.—Decouverte des Ruines d'une ancienne ville Mexicaine, situee sur le Plateau de l'Anahuac. Par M. H. de Saussure. Paris, 1858. 8vo, pp. 24. (Presented by M. de la Roquette, Paris.) Also, Description d'un volcan eteint du Mexique, reste inconnu jusqu'à ce jour. Par M. H. de Saussure. Paris, 1857; 8vo. (Presented by M. de la Roquette, Paris.)

Lighterage.—Report of the Chamber of Commerce on the Charges at Quarantine for Lighterage, &c. New-York, 1858. 8vo, pp. 16. (Presented by J. Smith Homans, Esq.)

Statistical Society.—List of the Fellows of the Statistical Society of London. (Session, 1858–59. London, 1858. 8vo, pp. 24. (Presented by the Society.) Also, Journal of the Statistical Society of London. June and September, 1858. London: John William Parker & Son. (Presented by the Society.)

Livingston.—The Farewell Livingston Festival, 13 February, 1858. 8vo, pp. 28. (Presented by M. de la Roquette, Paris.)

Exposicion Universal de Paris.—Acto Solemne de la Distribucion de los Premios obtenidos por la Isla de Cuba, en la Exposicion Universal de Paris. Habana, 1857. 8vo, pp. 12.

Acto Solemne de la Distribucion de Premios a los alumnos de la Escuela General Preparatoria y especiales de esta ciudad. Habana, 1857. 8vo, pp. 24. (Presented by the Sociedad Economica de la Habana.)

Reglamento de la Caja de Proestamos, Depositos, Anticipaciones y descuentos.—Habana, 1857. 8vo, pp. 14. (Presented by the Sociedad Economica de la Habana.)

Cuba.—Geografia fisica y politica de la Isla de Cuba, por Felipe Poey. Habana, 1858. 8vo, pp. 48. (Presented by the Author.)

Mexico.—Voyage au Mexique decouverte d'un ancien volcan: lettre de M. H. de Saussure a M. de la Roquette, V. P. de la Soc. de Geog. de Paris. 1857: 8vo, pp. 16. (Presented by M. de la Roquette.)

Agriculture Francaise.—Annales de Sciences Physiques et Naturelles d'Agriculture et d'Industrie, publiees par La Societe Imperiale d'Agriculture, etc., de Lyon. Deuxieme Serie: tome VIII, (1856,) and Troisieme Serie: tome I, (1857.) Lyon and Paris. 8vo, pp. 716–560, with numerous illustrations. (Presented by the Society.)

Malte Brun.—Nouvelles Annales des Voyages, de la Geographie, de l'Histoire, et de l'Archéologie. Redigees par M. V. A. Malte Brun. Sixieme Serie—quatrieme annee, (January–August,) 1858. Paris: Arthur Bertrand. (Presented by M. de la Roquette, V. Pres. of Soc. de Geogr. de Paris.)

Esquisse Geographique du Bassin de la mer d'Aral, et quelques traits des mœurs des habitants de Boukhara, Khiva et Kokan. Par M. Eugene Lemansky, Sec. de la Soc. Imp. Geographique de Russie. Paris, 1858. 8vo, pp. 40. (Presented by M. de la Roquette.)

- Essai sur l'état physique, moral and intellectuel des aveugles-nés, avec un nouveau plan pour l'amélioration de leur condition Sociale.* Par P. A. Dufau. Paris, 1837. 8vo, pp. 222. (Presented by M. de la Roquette.)
- Defrance.*—Notice Biographique sur M. Defrance. Par M. A. Damour. Paris. 8vo, pp. 12. (Presented by M. de la Roquette.)
- La Russie du XVII. Siecle, dans ses Rapports avec l'Europe Occidentale; recit du voyage de Pierre Potemkin, envoy en ambassade par le tsar Alexis Mikhaïlovitch a Philippe IV. d'Espagne, et a Louis XIV en 1688, precede d'un aperçu de l'état social et politique des trois pays a cette époque.* Par le Prince Emmanuel Galitzin. Paris: Gide et J. Baudry, Editeurs; 1855. 8vo, pp. 448. (Presented by M. de la Roquette.)
- Habana.*—Reglamento que debe observarse en la Biblioteca de la Real Sociedad Economica de la Habana. Habana, 1858. 8vo, pp. 40. (Presented by the Society.)
- Les Sources du Nil.*—Par Amedee Poussel. Paris, 1858. 8vo, pp. 8. (Presented by M. de la Roquette.)
- Discours de M. Garcin de Tassy: a l'ouverture de son cours d'Hindoustani, a l'école imperiale et speciale des langues orientales vivantes pres la Bibliotheque Imperiale.* Paris, 1857. 8vo, pp. 16. (Presented by M. de la Roquette.)
- Indo-Europeennes.*—Considerations Generales sur la philologie comparee des Langues Indo-Europeennes. Par M. Jules Oppert. Paris, 1858. 8vo, pp. 20. (Presented by M. de la Roquette.)
- Imperiale Geographische Societe de la Russie.*—Compte-Rendu de la Societe Geographique Imperiale de la Russie, pour l'annee 1856. St. Petersburg, 1857. 8vo, pp. 48. (Presented by M. de la Roquette.)
- Repertorium ueber die vom Jahre 1800 bis zum Jahre 1850, in Akademischen Abhandlungen, Gesellschaftsschriften und wissenschaftlichen Journalen auf dem Gebiete der Geschichte und Ihrer Huelfswissenschaften erschienenen Aufsätze.* Von Dr. W. Koner, Custos an der K. Universitäts-Bibliothek zu Berlin. Vol. I, (1852, 1st part, (1853,) and 3d part, (1856.) Vol. II. Berlin, 1852-56. (Presented by the Author.)
- Nachrichten von der Georg-Augusts-Universität und der Koenigl. Gesellschaft der Wissenschaften zu Goettingen.* 2 vols., 12mo. Goettingen, 1856 and 1857. (Presented by the Royal Society of Sciences of Goettingen.)
- Zeitschrift fuer Allgemeine Erdkunde.* Von Dr. K. Neumann. No. 53 to 61, Nov. 1857, to July 1858. Berlin. (Presented by Dr. W. Koner, Librarian Royal University, Berlin.)
- Bericht der Oberhessischen Gesellschaft fuer Natur- und Heilkunde.* June and Oct., 1858. Giessen. (Presented by the Society.)
- Goettingische Gelehrte Anzeigen: unter der Aussicht der Koenigl. Gesellschaft der Wissenschaften.* 6 vols., 12mo. 1856 and 1857. Goettingen. (Presented by the Royal Society of Sciences of Goettingen.)
- GEOGRAPHICAL AND STATISTICAL WORKS RECENTLY PUBLISHED.
- Annuaire de l'Economie, Politique et de la Statistique, pour 1859 (15th year.).* Par M. M. Block et Guillaumin. Paris: Guillaumin & Co., Editeurs du "Journal des Economistes," etc., 12mo, pp. 680.
- American Almanac and Repository of Useful Knowledge for the year 1859.* Boston: Chas. C. Little and James Brown.
- British Almanac and Companion for the year 1859.* Published under the Direction of the Society for the Diffusion of Useful Knowledge. London, (Eng.) 1 vol., 12mo.
- Almanac de Gotha—Annuaire Diplomatique et Statistique, pour l'annee 1859 (86th year of publication.)* Gotha: Justus Perthes. 1 vol., 32mo, pp. 886.
- Practical Miner's Guide: a treatise on mine engineering, comprising a set of trigonometrical tables, etc.* By J. Bridge. New York: G. M. Newton, at the office of the "Mining Magazine." 1 vol., 8vo., pp. 191.
- Travels and Discoveries in North and Central Africa: being a journal of an expedition undertaken under the auspices of H. B. M.'s Government in the years 1849-1855.* By Henry Barth, Ph. D., D. C. L., etc. With maps and illustrations. New York: Harper & Brothers. 3 vols., 8vo.
- The Land and the Book; or, Biblical Illustrations Drawn from the Manners and Customs, the Scenes and Scenery of the Holy Land.* By W. M. Thompson, D. D., twenty-five years a missionary of the A. B. C. F. M. in Syria and Palestine. With two elaborate maps of Palestine, an accurate plan of Jerusalem, and several hundred engravings, etc. New York: Harper & Brothers, 2 vols., 12mo.
- Curiosities of Natural History.* By Frank T. Buckland, M.A. (From the 3d London Edition.) New York: Rudd & Carleton.

JOURNAL

OF THE

American Geographical and Statistical SOCIETY.

VOL. I.

FEBRUARY, 1859.

No. 2.

PROCEEDINGS.

FOURTH MEETING, February 3d, 1859. The President in the chair.

The following named gentlemen were elected members of the Society :

William Caldwell, John C. Henderson, Rev. E. H. Chapin, D. D., John McMullen, *Adam Norrie, *Daniel H. Arnold, *George C. Ward, *Royal Phelps, *Reuben Withers, *James Punnett, *John C. Green, *Auguste Belmont, *Geo. Griswold, *William H. Fogg, *John C. Havemeyer, *Augustus Schell, *John D. Wolfe, *Richard Lathers, J. G. Pearson, Judge Constant, Alfred Pell, Jr., Matthew Morgan, Chas. T. Cromwell.

The special committee appointed at the annual meeting to audit the accounts of the Treasurer, submitted a report which was read, accepted and ordered on file.

The proposition submitted by Dr. Adamson, at the last meeting of the Society, for the election of Missionaries, and Secretaries of Missionary and Religious Societies, as ex-officio Members of the Society, was, on motion of Mr. Lefferts, referred to the Council to inquire and report upon.

Hon. Sylvester Mowry read a paper on the "Geography and Resources of Arizona." A vote of thanks was tendered to Mr. Mowry, and a copy of his paper requested for the Archives of the Society.

* Life members.

Mr. Viele moved that the Special Committee appointed to co-operate with Dr. Hayes for further Arctic Research, be increased from five to fifteen members, to be appointed by the Chair. Adopted.

The President announced to the Society that the New Rooms in Clinton Hall would be inaugurated on Thursday next. A special meeting would be held, and the Library and Collections would be open for examination.

Adjourned.

DEPARTMENT OF GEOGRAPHY.

OROGRAPHY OF THE WESTERN PORTION OF THE CONTINENT OF NORTH AMERICA.*

The American Continent has been divided in the temperate zone into three portions, which correspond to Geographical, as well as Geological divisions :

1st. The Oriental or Atlantic portion bounded by the Valley of the Mississippi on the west.

2d. The Middle portion, embracing the Rocky Mountain region and the basin country lying to the west.

3d. The Pacific or Western portion extending from the lofty mountains west of 116° long. W. to the Pacific shore.

* "Notes upon the Orography of the Western portion of the Continent of North America. A paper read before the American Geographical and Statistical Society, by THOMAS ANTISELL, M. D., Feb. 19, 1857.

The Geological relations of these sections may be thus indicated:

The 1st embraces the region of primary and silurian rocks;

The 2d embraces the palæozoic strata; and

The 3d " the tertiary strata.

Not that it can be affirmed that any one of these subdivisions contains only one of these classes of rocks, but merely that in those localities the most extensive and best marked deposits thus characterized may be found.

Each of these portions has its surface diversified by long and lofty chains of mountains which run in a direction north and south; those in the western section tending more to the east as they pass southward, while the chains on the east side of the continent tend to the west. Thus a triangular shape is conferred on the continent which forms, as it were, a section of a funnel, with the mouth open to the north, and thus exposed to the passage of the north wind, which, blowing so severely over three-fourths of the continent, as far south as latitude 35° , renders the influence of the south winds, which are laden with warm air and moisture, only manifest during the summer season.

The portion of the continent over which the north wind does not dominate, is that which lies west of the Rocky Mountains, and north of lat. 40° .

The present communication is confined to the central and western portions with their mountain chains and valleys, lying between the Rocky Mountains and the Pacific Ocean.

The view taken by many European geographers and naturalists, (and which originated with Humboldt), that all the great elevations of the American continent belong to that long chain which, under various denominations and with many interruptions, extends from the mouth of Mackenzie's River to Cape Horn, can with difficulty now be sustained.

For along the Pacific coast, from Vancouver's Island to the extremity of the peninsula of California, runs the coast range of mountains, whose direction is not parallel to, though de-

termining, the coast line for so many hundred miles, and which neither topographically nor geologically have any resemblance to, or dependence upon, the Rocky Mountains. The coast mountains are a series of parallel ranges, sometimes as many as six, running N. 45° W., whose north-western edges form the promontories on the Pacific coast. The ranges are separated from each other by narrow valleys of great beauty and fertility, which form the most populous districts of California and the territories to the north. Having the same mineral constitution, and uplifted by the same force, they naturally form but one mountain chain, whose breadth varies from 30 to 80 miles, and whose general direction is under meridian $123^{\circ} 30'$ from Vancouver's Island to Cape Mendocino. From thence to its southern termination, its direction is south, 20° east. In latitude $34^{\circ} 30'$ it meets with the southern extremity of the Sierra Nevada, where the range culminates in the Coco-Mungo, San Bernardino and Temecula Hills.

To the east of this extensive, though low range of hills, few of whose summits reach 4,000 feet altitude, lie the Cascade Mountains and the Sierra Nevada, of which notice is given more in detail hereafter.

Both of these chains aid in running the coast line in a direction nearly north and south, and thus influence *solely* the form of the west side of this continent, as far south as lat. 30° . The form of both sides of the continent, south of parallel 30° , is due to the Rocky Mountain range, which extends south to the volcanic system of Mexico, which between parallels 18° and 20° , runs in a direction nearly east and west, elevating the mainland of Honduras and Yucatan on the east, and stretching out westward into the Pacific, and reappearing as the Revillagigedo Islands. Not any one of these ranges are subordinate to or dependent on the Rocky Mountains.

The central spine of the continent, the Rocky Mountains as they are inappropriately termed, extend from Mackenzie's river to the mouth of the Rio Grande, and should not be considered

in any part of their course as a single chain, but as a series of parallel chains, including elevated valleys, and separated to some extent from each other by low swelling grounds, forming the important mountain passes.

The number of parallel chains increases as we pass south, until, in parallel 34° and 36° , where the Rocky Mountains are widest, as many as six distinct chains, running north and south, may be traced.

The result of so many ruptures of the crust within a space of 560 miles (between parallels 32° and 40°), must seriously affect the general level of the continent, and hence there is found a great plateau elevated many hundred feet above the regions lying north, which, the nearer they approach the polar circle, gradually drop down into the low land bordering the shore of the Northern Ocean. The Rocky Mountain range is found traversing both elevated and depressed portions of the continent, presenting, on the one hand, toward the north, mountains whose summits reach 12 to 14,000 feet high, yet whose base and valley adjoining does not exceed in altitude a few hundred feet. On the other hand, in lat. 33° , the valleys, for five hundred miles across the continent, have an elevation approaching five thousand feet, the hills themselves rarely exceeding 3,000 or 4,000 above their base.

In this lower latitude, the valleys are not slopes but level plains. To the eye looking across them, the country appears as if the depressions between these chains had been filled up evenly to the base of the hills, while as yet they were under water, and the fine sand sifted so as to give a floor perfectly even and smooth; and that it is not the whole mountain which we see, but merely the crest of the range, peeping up here and there, above the depths of an accumulated ancient alluvial deposit, and finally, that the successive ranges from east to west are so many crests protruding up from a common granitic basis. The similarity presented by the physical appearance and the geological structure, would confirm the truth of this supposition.

This chain extends farther north than any other mountain range on the continent, for it does not wholly terminate at the mouth of Mackenzie's river, but stretches along shore in the same direction, which it usually held—north 20° west—forming lesser ranges which define the shore line of the Icy Sea, passing along Point Beechy until Point Barrow is reached near lon. 161° .

Between lat. 50° and 70° north, and from Mackenzie's river to the shores of Hudson's Bay, there is not an elevated mountain chain, nor any evidence of volcanic forces having been recently exerted within this area; yet there is in this limit a belt of granitic land extending from the mouth of the Coppermine river, in a south-easterly direction, to the shores of Lake Superior. If a line be drawn between these two points, it would define the eastern limit of the belt of primary rock, which forms hills not more than 500 or 600 feet above the level of the surrounding land, enclosing little valleys containing lakes in their depressions. It is eminently the lake country of the north, and so even is the country over several hundred miles, that the drainage does not run in any one direction, but follows that which a slight local irregularity might determine. Franklin in his first voyage north to the mouth of the Coppermine river, crossed this granite tract, and found it 200 miles wide. It includes in its course Great Bear Lake, Slave Lake, Athabasca, Woollaston and Deer lakes, Lake Winnipeg and the Lake of the Woods. Many large rivers, as the Saskatchewan, Beaver and Churchill rivers, cross this tract completely in their eastern course, forming here and there low, swampy flats. Granite, gneiss, mica-slate and amphibole rocks form the whole of this country, which no where attains a mountain elevation. West of this, the land gradually rises to the base of the Rocky Mountains, and to the east the slope is more gradual until the level of Hudson's Bay is reached. On the eastern slope silurian strata are formed. Vast deposits similar to those of middle New York, deposited almost horizontally, and so slightly elevated since

deposition, that no fracture or disturbance of these ancient stratified rock has occurred. So slight is the slope of the deposit towards Hudson's Bay, that on reaching its shores, the shallows extend far into the bay, and vessels at anchor in five fathom water, are at such a distance from the land, that the cedar trees on the low shore are hardly discernible.

These silurian deposits have undergone little change of elevation since the period of their deposit, and this granitic belt must be looked on as among the first upheaves of the American continent; and that which determined the primitive shape of our continent, long anterior to the elevation of the Alleghanies, the Rocky Mountains, the Cascades, Sierra Nevada, or any of the minor ranges of the centre of the continent. The primal continent did not pass south of lat. 45° N., and the additions of land which have been made have been, in the first instance east of meridian 95° , and then west of that.

The next northern range influencing the form and climate of the continent is the Cascade range, which is a series of lofty mountains disposed in a single massy range containing both active and extinct volcanoes. The southern termination may be considered at Shasta Peak in California, while to the north it is prolonged through Oregon and Washington Territory into the British possessions, where north of lat. 62° , it meets the range which runs through Russian America into Alatska. This latter range is the representative of the coast range of mountains which are so well developed in California. In Oregon and Washington, the Cascades and the coast ranges appear to be blended to some extent, and not separated by the large interval of repose characterised as the Sacramento and Tulare Valleys at the western base of the Sierra Nevada.

To the east of the Cascade range, north of lat. 50° , there are no ranges until the mouth of Mackenzie's river is reached, when the Rocky Mountains are encountered. The eastern side of the Cascade range is much more rugged and steep than the western, where the grade to the shore is interrupted by a series of

lesser hills intervening. Throughout its whole course it runs in a direction almost due north and south, confining itself between meridians 121° and 123° , with a general elevation of 8,000 feet, attaining in a few points, from 15,000 to 16,000 feet.

The passes in the Cascades are few, and none of them very low. In places the whole has been dislocated by subterranean disturbances, as where the Columbia passes through to reach the shore, but few are less than 3,500 feet, or half the average height of the chain.

So continuous and decided a range as this must exert a marked influence upon the climate of the lands lying to its east. These are, in general, flat basaltic plains, covered with volcanic debris, and traversed by a few large rivers, but not watered by lakes or fed by small streams to any extent. The atmosphere is also remarkably healthy, clear and dry. On the western side everything is the reverse of this. Moist air, abundant rains and snows, with numerous and copious streams.

On the low lands and along the shores of the Pacific, until the mountain range is reached, the climate is mild. The isotherm line of 39° passes over Puget's Sound, and a mild winter, with many falls of rain, is the consequence. These rains become snows on the mountains, where they attain great depths during the repeated falls, unaccompanied by thaws.

Ascending the chain, the snows deepen, until, in the passes, a depth varying from 20 to 50 feet is met with. At these elevations the winter temperature is excessive. Once the season has set in, no further thaws occur; the moisture falls as snow entirely, which accumulates, and which, in some cases, the summer ensuing does not wholly melt. The summer itself is short and cold, and even August sometimes finds the thermometer at the freezing point in the morning, and one half inch of ice to have been formed at night.

From Puget's Sound, where the winter temperature is that of Charleston, S. C., along the coast southwards, the temperature gradually

increases, until, at San Francisco, it amounts to 51° Fahr. The increase of warmth above that of the Atlantic coast in similar parallels is chiefly produced by the warm current of water which rolls southward from Bhering's Straits with its superincumbent current of warm air. This current becomes a north-west wind, which is always moist and warm, and is the cause of the large annual deposit of rain, amounting to more than 40 inches in Oregon, and near to 50 inches in Washington Territory. The rarification of the air upon the low shore valleys determines a current flowing off the sea toward the land. This increase of temperature is felt even up to Russian America, where the eastern shores of the Straits have a vegetation which might be considered inter-tropical, when contrasted with the Arctic vegetation of the Asiatic side of the Straits. The effect of this warm current of air does not extend east of the Cascade chain; nor any where along the Pacific coast does the influence of the ocean extend beyond the first lofty range of mountains.

The rain which falls annually on this coast diminishes rateably as we advance south; thus, 46 inches of rain at Steilacoom, becomes 23 inches in lat. 40°, 15 inches in 37°, and 10 inches in 32°. Hence it is that the snows are so much deeper on the Cascades than in the Sierra Nevada; and hence, also, that south of 33° is a desert country east of the Cordilleras. From the shore inland the amount of rain-fall also diminishes, and its influence is well seen on the northern Sierra Nevada, where the pines are found growing only on the western summits and slopes; and when these are passed, cedars are found, and still farther east even the cedars disappear, to give way to artemesia, cactus, and thorny plants. Such is everywhere the character of vegetable growth, and the manner in which the absence of moisture is evidenced, as we advance eastward, after crossing the high ranges of mountains.

Where the Cascade mountains terminate at the south, the Sierra Nevada commences, and passes in a southerly direction until it terminates in lat. 34°, by merging into the

coast range. In passing over 6 degrees of latitude, its exact course is south 15° east. Although running in a line nearly similar to that of the Cascades, this range must not be considered a continuation of the Cascades in a geological sense; for while the latter are a series of hills uplifted by direct volcanic action, and many of its mountains either active or extinct volcanoes, it cannot be said—with our present information—of the Sierra Nevada, that there is a single mountain in its chain which bears the evidence of having been a volcano. Cut through as the whole chain has been, especially on its western flanks, by erupted rocks as trap and basalt, yet none of these can be considered as axial or capable of elevating the mountain system, which may be rather regarded as being produced by accommodations of the crust to the internal pressure reacting upon it. The Sierra is a continuous chain of massy mountains, slightly overlapping each other at the termination of the links, where, in some instances, passes are formed. The mass is of great breadth, being 60 miles across at the base. Like the Cascades, the gentler slope is that lying east, while that on the west side is abrupt and generally through narrow gorges. Everywhere on its west side the Sierra Nevada stands upon a lofty range several thousand feet high, clad with snow on the summits for many months of the year. On the east and toward the south, or in lat. 36°, its altitude above the desert level is also very great; but as this basin is traversed northward, its elevation increases, so that in 40° lat. the crests of the range are not more than 500 or 600 feet above the valley of Humboldt river; in ascending from which to enter California, the Sierra constitutes a series of high plateaus or parks, with low hills forming their margins.

The Great Basin is not as its name implies, a trough cut deeply below the level of its boundaries on either side, but is rather a series of elevated steppes, each steppe made up of valleys of limited extent partially bounded by short chains of hills running north and south, round the extremities of which one valley opens

into another. The hills are mostly below 2,000 feet high, a few attaining to 3,000 feet. Such are the Humboldt River Mountains. The plain over which this river runs is not a true valley, but a depression of the strata resembling a fault which determines the flow of the waters across the general strike of the mountains of the Basin. The river rises by two heads in the mountains of that name, and travels eastward about 300 miles, gradually diminishing as it rolls west, until it empties by a small stream into Mud Lake, at the eastern base of the Sierra. Formed wholly from the snow on the Humboldt Mountains, and not deriving waters from affluents in its downward course, it soon loses itself in the parched soil, resembling all the rivers of the Basin, which diminish as they flow onwards, until, under the influences of evaporation and absorption, they finally disappear. On account of the deficiency of moisture, there are no trees on the plains, and but a scanty supply on the solitary mountain ranges. Grass scanty and sparse, humble and thorny vegetation, with a sprinkling of composite plants, form the chief vegetation of the upper steppe of the Basin; while in the lower levels, as in the valley of Mojave river and the Colorado desert, owing to its less elevation and more southern latitude, the drought is greater; the valleys with grass and cottonwood only on the river bottom; the soil fertile where moist, but irredeemably barren where dry.

Three distinct levels may be defined in the Basin, which in its whole extent is 600 miles wide, and reaches from 32° to 42°, or 10 degrees, of a pear shape, with the stalk to the south, where the altitude does not exceed the sea level, while along the Humboldt river valley, the level approaches 4,000 feet. The variations of level of the basin are not separated by mountain chains, but by low, undulating swells of land, which serve as a divert to the waters descending from the mountains.

In the lower steppe, or the Colorado (basin) desert, it may be said almost never to rain; at least the rains are very few in the year—one shower in 8 months of 1854 being all that was

noticed by one living in a small cabin on the east side of the Sierra Nevada. The desert has an arid and sterile appearance, a few mesquit trees, cactus, artemisia and kindred plants are the vegetation. For miles together there is not a blade of grass. Alternately a sandy bottom or a bed of fine clay, and finally drift sands, until the Colorado river is reached. It is noteworthy of this river, that it does not flow in the centre of the valley, or at its lowest level, but at the side; carrying down a great amount of mud and debris in its large volume of water which occasionally overflows its banks.

The temperature of this desert is very great, amounting in June (1855) to 122° Fahr., at 2 o'clock, P.M., and 127° on one occasion, at 3 P.M., commencing at sunrise with 96° Fahr. Such temperatures must completely exhaust a soil of its surface water. Even the running streams, at the foot of the Sierra, under such warmth gradually dry up, and are lost before midday, leaving a channel as their only indication until evening sets in, when the waters gradually re-appear, and by night time the stream regains its original volume.

Nor is this dry and barren condition peculiar to the region immediately east of the Sierra Nevada. It extends as far eastward as the Rocky Mountains, and generally speaking up to longitude 96°: the whole interior of the continent for 21 degrees in the northern part of the United States, and for 17 degrees in the southern, is deprived of a due fall of rain, and most of that which falls does not descend at the time when it could be serviceable to vegetation. Even the central plains and valleys between the various chains embraced under the dividing ridges of New Mexico are merely able to support a scanty supply of tough grass, which can only support a limited number of cattle. In the river bottoms of New Mexico are the only seats of the population, and these are limited in extent.

Between 36° and 42° N. lat. lies the most elevated portion of the continent. For although the Rocky Mountains do not attain so great a height as farther north, yet they are

spread out more laterally, forming several mountain ranges, with high plains lying between. Indeed, between these parallels is an immense elevated mass of country, having the Sierra San Juan, De la Plata, Elk Mountains, the Park and Black Mountains, Santa Fe and Sandia Mountains on the east side, and on the west side Mogollon, Wabash, Uinta, Bear and Wind River Mountains. These mountains are but the erupted crests of a vast uplift of country, whose general elevation ranges from 4,000 to 7,000 feet on the plains. The Wabash Mountains form the western crest, beyond which the country drops down to the lower levels of the basin.

The great elevation of the continent within the limits indicated, results in bringing the sources of the largest rivers into juxtaposition. Thus, in lat. 55° , the carboniferous strata of the Rocky Mountains attain a height of 16,000 feet, and in this neighborhood three of the largest rivers head—the Saskatchewan, Columbia, and Mackenzie's rivers; and, according to a high authority, three of them from the same hill; Mackenzie's and the Columbia being only two hundred yards apart, and the Columbia and the Saskatchewan not more than 14 paces asunder. About lat. 43° the sources of Snake and Green rivers are not many miles apart. The sources of the Yampai and Platte rivers are divided by a single ridge of mountain; and an affluent of Grand river, and the north fork of the Platte river, are found in the same valley; so that in lat. 40° and 42° the waters roll north-west into the Pacific, south-west into the Gulf of California, east to the Mississippi Valley and south to the Gulf of Mexico.

The mountains forming the east edge of this lofty plateau have a direction varying slightly from the meridian. In parallel 46° , the Black Mountains lie under longitude 104° . In parallel 31° they pass under the same meridian, their general trend is north and south; for small distances it is north, 12° west. The western ranges, as the Wabash, Pinal-lano and Mogollon Mountains are more north-west and south-east, and hence they tend southward to merge

into the other, and both together coalescing, form the narrow upland of Mexico. It is this last series of mountains which is continuous with the Rocky Mountains of the British possessions, the eastern ranges terminating in the Black Hills, which lie south of the Missouri river, where it turns eastward.

The configuration which Mexico now presents—a peninsular plateau running north-west and south-east, of great elevation and abruptness on its western face, and dropping to the sea level at the east by well defined plains of lesser altitude—was that which the whole North American continent possessed during the latter Secondary and earlier Tertiary periods; then a wide sea separated the Apalachian hills from the highlands of the central chain, and reached from the Gulf of Mexico to Hudson's Bay, while a scarcely less extensive belt of water reached from the Bitter Root Mountains to the Gulf of California.

Could a geographer have examined our continent at that period, he would not have failed to have observed what is not yet acknowledged to the extent which it deserves, namely: that the plateau of this continent, between parallels 30° and 44° , is as well defined as that of Mexico, and is continuous with it. The numerous chains of the Rocky Mountains constitute or involve this plateau; and since the number of parallel chains northward is great, the width of the plateau corresponds, while to the south, (Mexico), the plateau is made up solely of the western chains, the eastern ones having terminated in Texas and at the Gulf of Mexico. The limits of the plateau to the north are the Park Mountains and Black Hills, around which the Yellowstone and Missouri sweep from their source in the Wind River Mountains. These latter, constituting the north-western edge of the plateau, connect it with the Bitter Root Mountains farther north; thence to the Arctic Ocean, no plateau has been observed. The Rocky Mountains, depressed in latitude 46° and 48° , rise again as lofty hills in 60° ; and thence their altitude gradually falls to 2,000 feet, until they reach the Polar regions,

The prairie lands terminate near Peace river, and north of Great Slave Lake no flat country skirting the base of the Rocky Mountains has been observed. A single chain of hills represent the series above lat. 62°.

The following list enumerates the chains which form the eastern and western margin of the central plateau :

Lat.	On the West.	On the East.
48°—45°	Bitter Root M'tains.	Rocky M'tns (proper.)
45°—43°	Salmon River "	{ Snow " "
43°—38°	Wahsatch.	{ Big Horn Mountains.
34° 50'—33°	Mogollon.....	{ Black Hills.
		{ Park Mountains.
33°—32°	Sierra Catanna...	{ Sierra Blanca.
		{ Guadalupe.
31°—	Santa Cruz.	

The eastern chains pass east of the Rio Grande, and do not form any portion of the elevated plateau of Mexico; while those chains lying west of that river enter Sonora and Chihuahua, and become the Sierra Madre of that country.

In thus tracing the central plateau with its ridges superimposed, and its relations to the other meridional and more western systems, the remarkable fact presents itself, that nowhere west of 100° long. (Greenwich) is there a chain of mountains whose axis and direction is from east to west. All the forces which have elevated mountains over that large portion of our continent have been exerted so as to produce meridional elevations; and all connections between the central plateau and the Cascade Mountains, or the Sierra Nevada, are by the intervention of a series of lesser chains, whose trend is north and south. Such are the Humboldt River Mountains, and all those found on the Great Basin, even to the head of the Gulf of California. The parallelism of the upheaving forces exerted on the western half of this continent is very remarkable.

The points which are deemed of importance to be noticed, are :

1. The direction of the great plateau-spine or ridge of the continent, which, in lat. 50°, lies west of long. 114°, in lat. 43°, has extended east to 110°. In lat. 37° its eastern limit is 105°, and in lat. 30°, 104°—its course

north of 40° being in the north-west direction, but south of 40° it is almost meridional. These are its eastern limits; the western ones are in parallel 50°, long. 118°—in parallel 40°, long. 112°—the same in 37° lat., and in 32°, 110°—and thence in a south-easterly course into Mexico. It may be perceived that the greatest width of the parallel chains is in lat. 37°, or 36° where it measures 8° across, narrowing to 4° in the British possessions, and to nearly 6° when it enters Mexico. Where its width is greatest, its altitude also is greatest. Owing to its altitude the winter temperatures are severe, and the summers deficient in a supply of rain, either not sufficient in quantity, or not falling at the favorable season, to support grass or herbage; hence, the interior of the continent is a desert everywhere, except in the narrow bottoms of the larger rivers. This spine, which, in the centre of the United States, consists of a central elevated mass of land supporting as many as six ranges of mountains from west to east, is depressed toward the north, and supports only two, and is also depressed toward the south, where there is not one continuous range, but a series of short chains, with level plains between and surrounding them.

2. That the extension of the continent westward is due to a second spine of lesser importance than the Rocky Mountains, extending from Russian America into Lower California. This spine, lofty in the north, and containing many volcanic mountains, considerably modifies the climate of the country lying to the east, by depriving it of its due supply of moisture, rendering the whole country, called the Great Basin, almost perfectly sterile.

3. The moisture and rain-fall of the country lying between these two chains, is derived, in the north, from the surplus moisture of the winds from the Pacific which have already deposited most of their vapor on the Cascade Mountains in the form of snow, averaging a depth of thirty feet thick, and in some passes, as at Yakima, even fifty feet deep. The moisture of the south of the Basin desert is, on the

contrary, derived from the south-east winds coming from the Mexican Gulf, but which are also drained by passing over the elevated plains 4,000 feet high, and the eastern mountain chains along the Rio Grande, and thus have but little residual moisture to deposit; hence the whole of this district, from north to south, suffers from deficient supply of rain, and is to be classed with the uncultivable land at the eastern base of the Rocky Mountains. Hence, for all practical purposes of agriculture and civilization, this continent, from long. 100° to the base of the Cascades and Sierra Nevada, is unfitted for the support of man, except in some favored valleys, or at the base of the mountain chains.

THE COLORADO EXPEDITION.

THE COLORADO OF THE WEST AND THE COUNTRY BORDERING IT—THE GRAND CANON.

During the past year a careful examination of the lower Colorado, for the purpose of ascertaining its capabilities for navigation by steamboats, was made by Lieut. Ives, of the United States Topographical Corps. As everything connected with the region described in his Report of the expedition, possesses great interest, both in a scientific and commercial point of view, and as the report contains valuable information never before made public, a portion of it is herewith inserted. The steamer used by the exploring party was a small iron vessel, constructed at the mouth of the river. The ascent was commenced on the 31st December, and is thus described by Lieut. Ives:

I continued up the river for five hundred miles, reaching, on the 11th of March, in lat. $36^{\circ} 6'$, the mouth of a stream supposed to be Rio Virgen, beyond which it was impracticable to proceed in boats. I therefore sent back the steamboat and the hydrographic party to Fort Yuma, and taking advantage of the permission granted in the instructions from the Department, left the river on the 23d of March, with a pack train, to examine, as far as possible, the country through which the Upper Colorado and its tributaries flow.

Keeping as near as possible to the river, I traversed the region along the 36th parallel, the greater portion of which had been previously unexplored. Most of the line of the 35th parallel was also visited. Following various lines of examination, gradually conducting towards the east, I arrived, about the 1st of June, at Albuquerque, on the Rio Grande—the distance accomplished during the land explorations amounting to nearly nine hundred miles. At Albuquerque the expedition was broken up—a few members of the party still retained—returning home by the overland route to Fort Leavenworth.

During the progress of my work upon the navigable portion of the Colorado, the water happened to be, according to the evidence of those who had lived in that vicinity for many years, unprecedently low. An opportunity was thus afforded of trying the experiment of steam navigation at the worst stage of the river, and at a time when the difficulties ordinarily to be encountered would be considerably magnified.

The region at the mouth of the Colorado is a flat expanse of mud. The lines of the shore and the channels that afford entrances to vessels from the Gulf, are shifting and changeable, and bars, shoals, and islands, composed of a semi-fluid mass, are in constant progress of formation and removal. The navigation for thirty miles above is rendered periodically dangerous by the strength and magnitude of the Spring tides. They have a rise and fall of from 25 to 30 feet, and a flow of extraordinary velocity. The flood is preceded by a "bore" or huge tide-wave, from four to seven feet high. In certain narrow bends it is very powerful and violent, but gradually loses its force as it ascends, and at a distance of thirty miles is scarcely perceptible. Along wider portions of the river are curves of the shore in which its force is not felt, and here boats may be safely moored till this dangerous wave has rolled by. Upon the shoals are formed what are called "tide-rips," where the sudden check given to the rushing volume of water causes it to bound along in high successive waves. Steamboats that come to the mouth of the river during the spring tides must ascend above tide-water during the ebb, and start to return two or three hours after the commencement of the flood.

The neap tides have a rise and fall of only ten feet, and a moderate velocity.

Between tide-water and Fort Yuma, the principal obstructions to navigation are the sand bars. These become more frequent and difficult as the river is ascended. The channel is exceedingly circuitous and continually changing.

The average depth is about eight feet. Shoals were frequently encountered, however, where there was scarcely two feet of water. Experience alone can afford the capability of navigating this portion of the river successfully. A knowledge of the locality of the channel cannot be imparted, as it has been known to shift from one bank to the opposite one in a single night. From the formation of the banks, from the appearance of the water, of the eddies, of pieces of drift wood, and other floating substances, and of the islands and bars visible above the surface, a practiced eye can do much towards selecting the proper course; though boats rarely make a trip between tide-water and Fort Yuma, at the low stage of the river, without grounding many times a day. The bars, however, are composed of soft and loose material, and may always be passed with more or less labor, depending, in a great measure, upon the skill shown in the employment of the different methods of extrication resorted to.

Below Fort Yuma there are no rocks. The snags are numerous, but seldom dangerous.

During the months of April, May and June, while the river is rising, and before new bars have had time to form, the navigation is most easy. The average velocity of the current at low water is two and a half miles an hour—during the July freshet, from five to six. The river at this season is about ten feet higher than during the winter months.

For three or four years an enterprising company has been engaged in transporting Government stores, in steamboats, from the mouth of the Colorado to Fort Yuma, and their persevering energy has so far succeeded in overcoming the natural difficulties of the navigation as to enable them now to perform their trips with entire regularity and certainty.

For one hundred and eighty miles above Fort Yuma the navigation has a character similar to that already described. The river passes through several chains of hills and mountains, forming gorges or canons, sometimes of considerable size, and in these there is generally a better channel than in the valleys.

During the next one hundred miles gravelly bars are of frequent occurrence, and at some of them the stream presents almost the appearance of a rapid. In the interval between, in both valleys and canons, are stretches of good river, and, although the bad places are worse, the channel generally is better than it is below.

For the succeeding fifty miles the river-bed is composed, in a great measure, of coarse gravel and stones, and many swift rapids were encountered. Upon several were found not over

two feet of water. In this portion of the river there are a few sunken rocks that would be dangerous till their position became known.

The "Black Canon," which is twenty-five miles in extent, is now reached, and in it the rapids are numerous and difficult.

Above the Canon the river is wide and shallow, and assumes the character of a rapid for so long a distance as to render any attempts to carry boats to a higher point almost valueless; and considering the difficulty, hazard and expense that would be incurred, at the low stage of water, in taking steamboats through the Canon, I am of opinion that its mouth should be considered the practical head of navigation. Up to this point the Colorado, notwithstanding the difficulties to be encountered, may be pronounced navigable. The experiment was attempted, as has been stated, at a time when the river had experienced an unprecedented fall. At most seasons of the year the navigation would be much easier and better, and a boat of suitable model and dimensions, and drawing, when loaded, but two feet, would be able to ascend the Colorado to the mouth of the "Black Canon" with as much regularity and certainty as the steamboats now upon the river ply between the head of the Gulf and Fort Yuma. Although, during high water, the river experiences a great rise, the whole channel is not proportionately deepened. New bars commence at once to form, and at all seasons shoals are liable to be encountered. An iron stern-wheel steamer, 100 feet long and of 22 feet beam, built full and with a perfectly flat bottom, having a large boiler, and powerful high-pressure engine, and drawing, when light, but 12 inches, would be the description of boat best adapted to the service.

Wood of excellent quality, for the purpose of fuel, can be obtained in abundance on the bank, at short intervals, between the mouth of the river and a point fifteen miles below the mouth of the Black Canon. It is principally mezquite, willow and cottonwood.

A reconnoissance, made from the foot of the Black Canon towards the nearest point on the emigrant road to Utah, showed that a wagon-road might be opened between the trail and the head of navigation. For sixteen miles, while passing through the gravel hills and ravines that cover the eastern slope of the intervening range of mountains, the country is somewhat rough, and a little work would be required to make a good roadway, but, after reaching the summit, there would be no further difficulty. The distance from the river to the emigrant road is about forty miles.

The navigable portion of the Colorado runs nearly north and south. Near the Gulf the surface on either side is perfectly unbroken; the view being limited towards the west by distant spurs from the mountains of Lower California, and towards the east by the great Sonora desert. Further north broad valleys alternate with wild and rugged ranges of mountains of volcanic origin, that cross the river in almost parallel north-west and south-east lines. The canons formed by the passage of the river through some of these mountain chains are probably unequalled in beauty and grandeur by any similar formations.

In the Black Canon, the deep and narrow current flows between massive walls of rock that rise sheer from the water for over a thousand feet, seeming almost to meet the dizzy height above. The tortuous course of the river, as it winds through these sombre depths, where the rays of the sun rarely penetrate, gives infinite variety to the majestic outlines of the overhanging masses, forming combinations whose colossal proportions and fantastic sublimity it would be impossible to figure or describe.

Above the Canon, in the vicinity of the mouth of the Virgen, is the most rugged and sterile region that I have ever beheld. Barren piles of rock, heaped together in chaotic disorder, and exhibiting on their broad surfaces no trace of vegetation, extend for miles in almost every direction. The volcanic upheavals, which have here their northern limit, appear to have experienced also their most violent action. Beyond, towards the north and east, the country is undisturbed, and a region is entered upon that presents totally new features and peculiarities.

This is a vast table-land, hundreds of miles in breadth, extending eastward to the mountains of the Sierra Madre, and stretching far north into Utah. To the extreme limit of vision immense plateaus rise, one above the other, in successive steps, the floors of the most elevated being from seven to eight thousand feet above the level of the sea. The Colorado and its tributaries, seeking the level of the low region to the south-west, have, by ages of wear and abrasion, cut their way through this huge formation, making canons that are in some places *more than a mile in depth*. The mighty avenues of the main water-courses are the thoroughfares into which smaller but still giant chasms debouch, and these in turn have their own subordinate tributaries, forming a maze of yawning abysses, generally inaccessible, and whose intricacies it would be a hopeless task to attempt to unravel. Twice only, after long

and difficult clambering down the sides of the precipices, and through walled approaches that seemed to be leading into the bowels of the earth, were the banks of the streams below finally attained. One place was on the Colorado itself, and the other near the mouth of one of its larger tributaries. Except at the place of descent, the canon of the river, as far as it could be seen, showed no place of practicable ingress or outlet, and the appearance of the torrent, foaming and surging along its confined bed, left little room for doubt as to what would be the result of any attempt, such as has been sometimes suggested, to explore the river in boats from its sources above.

So numerous and so closely interlaced are the canons in some portions of this singular region, that they have displaced all but scattered remnants of the original plateau, leaving narrow walls, isolated ridges, and spires so slender that they seem to totter upon their basis, shooting up to an enormous height from the vaults below.

The natural surface of the country opposes insurmountable barriers to traveling in any fixed direction, and the aridity of the accessible portions of the table-lands rendered the explorations difficult. Though the season of the year was the most favorable for finding water, much inconvenience was experienced from its scarcity, and it is doubtful whether, during the dry months, the examinations could have been prosecuted at all.

A discussion of the agricultural value of the region explored, or its capability of sustaining a population, would involve many considerations, some of an intricate character, a fair exposition of which would require a degree of detail much beyond the limits of the present communication. A few general facts and conclusions can only be stated.

During the explorations all of the lands upon the Colorado, from its mouth to the 36th parallel, and the greater portion of the region along both the 36th and 35th parallels between the Colorado and the Rio Grande, was traversed. Much of the country had been previously explored, and a considerable portion of it, particularly some of the open valleys of the Great and Little Colorado river, and the Navajoe country, pronounced by excellent authorities a good agricultural region, capable of a high degree of cultivation. Many facts were noticed during the examination that tended to confirm this view, but many unfavorable features were also apparent.

Of the valleys upon the Colorado, that of the Mojave Indians, which borders the 35th paral-

lel, is by far the finest, and is perhaps the most promising-looking region in the portion of New Mexico west of the Rio Grande. It was visited in the season of Spring, which, in that climate, is during the month of February. The atmosphere was indescribably balmy and delicious. A pale transparent haze of a peculiar delicate blue, which all must have noticed who have been in this valley, enveloped it with a softened glow. In brilliant contrast to the dark and frowning mountains on either side were groves of trees, with fresh and beautiful foliage, dotting the whole expanse of the foreground. Fields of wheat, corn, beans, pumpkins and melons, promising a luxuriant crop, met the eye in every direction. Comfortable houses and well-built granaries, overflowing with the last year's stores, testified to the provident affluence of the inhabitants, and the robust appearance of the people themselves, with their well-developed frames and solid, glossy limbs, betokened a high degree of health, comfort and good living. That, for the number of Indians who now inhabit it, with their habits and mode of life, the country is an excellent one, there can be no doubt. Whether it could ever be of much value to whites, admits of a great deal of doubt.

The shifting of the bed of the Colorado would be a source of great trouble in so narrow a valley. The changes occur with a rapidity and to an extent that can scarcely be appreciated by one who has not witnessed them. Having passed through the country in the spring of 1854, while accompanying the expedition of Lieutenant Whipple for the location of a railroad route along the 35th parallel, I had an opportunity of observing the effects of this action, which were so great as to justify the inference that every portion of the cultivable bottom lands is liable to be, in turn, overrun by the river. To the Indians, who have a certain community of property and interest, and no valuable improvements to lose, this is a matter of no vital moment; but the white settler would be much discouraged from putting up buildings and fences, and digging the ditches necessary for purposes of irrigation, by the knowledge that the river might at any day direct its course through his premises.

Freshets occur at periodical intervals, which subject large portions of the valley to inundation. Four or five months of the year the rays of the sun are so intense and burning that no vegetation can withstand their influence, and, during the very early spring, sometimes, when at midday there is an ordinary summer temperature, ice formed at night. The growing season is thus rendered exceedingly short, and a

single accident to a crop would, for that year, be without remedy. Seasons have occurred, within a few years, when the Mojaves have been subjected from this cause to great privations, and lost considerable numbers from actual starvation.

The composition of various portions of the soil was carefully examined by Dr. Newberry, the geologist of the expedition, and I am informed by him that though much of it is so constituted as to be fertile, very large tracts in the higher parts of the valleys are so impaired by an excess of alkaline substances as to be comparatively valueless.

In forming an opinion of the value of the region, some weight, too, should be attached to the fact that the races upon the river do not multiply. The records of the early Spanish explorers show a diminution rather than an increase of population since that period, and for this there is no assignable cause, unless it may be the incapacity of the country to sustain a large number of inhabitants. The Mojaves have had no communication with the whites, excepting when a wandering trapper, or some exploring party, has passed by their territory. A peaceful yet a powerful people, and guarded on all sides by difficult mountains, they have suffered but little from wars with other tribes. Their mode of life has conduced to the highest state of physical development. The marriage relation, as has been noticed by all who have been among them, is respected in more than an ordinary degree among the Indians, and there seems to be no reason, except that above stated, why they should not have become a numerous nation.

The remark made respecting this locality will apply, and perhaps in a stronger manner, to the rest of the country on the river, and also to the valley of the Little Colorado. The latter region abounds in ruins and vestiges of a former population, but is now uninhabited.

The remainder of the great area of territory examined, presents also its discouraging features. The northern portion is much the worst. Besides the deserts that have been alluded to, in the timbered region itself, are found broad tracts where the vegetation has become extinct, and the white and withered trunks are scattered, like monuments, over a vast cemetery of departed life. No indication of fire exists. The destruction has been gradual, and an impression is conveyed of some deadly rot slowly creeping over the surface of the country. Want of rain is undoubtedly the great cause of the evil. Near the abandoned ruins of several of the Moquis towns, no water can be found. This

people, though exposed to no contact with the whites, have partially dwindled away, and their ultimate fate, if the same meteorological condition continues, can be a question of little doubt.

Along the 35th parallel, within the limit of the volcanic disturbances, much of the country is better, and, at some seasons of the year, very attractive. After the melting snows of Spring, and during the autumnal rains, a more smiling picture of green forest glades, sparkling steams, verdant hills, and wild flowers, the eye could not desire to dwell upon; and excepting that the surface of the soil is in most places closely packed with lava rocks, there would seem to be a promising field for the agriculturist. Evidence, however, has been collected of seasons of drought so excessive as to render it doubtful whether more than a small portion of the country could ever be inhabited.

Over the whole of this region and that first alluded to, remains of buildings and fragments of pottery are found, and the fact has been adduced as an argument to establish the present capability of the country to sustain a population; but there is an analogy between these mouldering ruins and the dead forests near by suggestive of a different conclusion, giving rise to a doubt whether the decay of one race of inhabitants might not have been induced by influences that would be effectual to prevent the introduction of another.

The mineral resources of some parts of the country explored are considerable. The ranges of mountains that cross the navigable portion of the Colorado, which belong to the same system as those of California and Sonora, are like them the repositories of a large amount of mineral wealth. They were examined by Dr. Newberry with as great thoroughness and care as the character of the expedition would permit, and found to be traversed by veins of such magnitude and richness as to give promise of a field of extensive mining operations. The metals, as far as observed, were gold and mercury, in small quantity; silver, copper, and lead in rich and valuable deposits; and iron in the greatest abundance. The close proximity of the treasures of these mountains to water transportation, greatly enhances their value. A copper mine, that promises to be highly successful, is now being worked forty miles above Fort Yuma.

In the country of the upper Colorado, the useful minerals found were iron, coal, rock salt and marble. From their geographical position they have little pecuniary value, though their existence in that region is a fact of great scien-

tific interest. On the sides of the canons were splendid exposures of the stratified rocks which compose the great table lands of New Mexico, exhibiting all the formations from the base of the series to the tertiary.

GEOGRAPHY OF THE UNITED STATES OF AMERICA.

NO. 2

THE article in the January number of the Journal was confined to a description of the immediate valley of the Mississippi River. It is now proposed to extend this description to the great plain that lies between the western bank of this river and the Rocky Mountains.

The leading characteristics of this plain are—its extent; the regularity of its outlines; the uniformity of surface, aspect, and slope toward the Mississippi River; the high elevation of its western summit, and the similarity of the meteoric conditions of many portions of it.

Its extent and boundaries:

The Mississippi River, which forms its eastern boundary, has for its whole extent a southerly direction—by far the greater part of its course being near the meridian of 91° west from Greenwich. The river crosses this meridian at eight different points—upon the parallel of 42°; three times near the parallel of 41°; once near the parallel of 40°; once upon the parallel of 34°, and lastly upon that of 30°. It has its source under the meridian of 95°, and its outlet under that of 89°. The most considerable deviations, from a very direct southerly course, are near its source and mouth, near both of which it has an easterly course for nearly 200 miles. At the mouth of the Ohio it deflects easterly about 150 miles to receive that stream. With these exceptions, which seem to correspond to similar deviations in the Rocky Mountains from a northerly and southerly course, the general southerly direction of the river is remarkably uniform.

The western boundary of the great plain is the Rocky Mountains, embracing under this name the whole extent of the range drained by rivers falling into the Mississippi River. At

the head of the Canadian, the most southerly branch of the Mississippi descending from the mountains, the water-shed between it and the Rio Grande is under the meridian of 105° . On proceeding north, the general direction of the mountain range inclines slightly to the west, as far as latitude 41° , when its inclination is increased to an angle of nearly 45° , until the parallel of 44° is reached upon the meridian of 111° . It then assumes a northerly direction which it holds to the boundary between the United States and the British possessions. The great plain therefore extends over $19\frac{1}{2}$ degrees of latitude, and about 16 degrees of longitude, embracing an area of more than 1,000,000 square miles. Within the boundaries described is included a considerable portion of the State of Texas, the great part of whose territory presents features of remarkable similarity to that lying far to the north under corresponding meridians. The general form of the whole is that of a *rhombus*, with sides 1,350 by 850 miles respectively in length.

The slope of this plain, within the territory described, is toward the Mississippi River, with a gradual falling off in both northerly and southerly directions from a central point between the parallels 37° and 39° . Between these it has its highest ascertained elevation. From this summit the waters descend to the Gulf of Mexico, the Gulf of California, and the Pacific Ocean. The elevation of this water-shed, or, to speak more correctly, the point of lowest elevation in passing from the hydrographic basin of the Rio Grande to that of the Colorado of the west, is more than 10,000 feet above the sea. A very high elevation is maintained for a considerable distance to the north and south of the summit. From it descend the Platte and Arkansas, which have currents much more rapid than any other considerable tributaries of the Mississippi and Missouri rivers.

Both the northerly and southerly extremes of the plain have very nearly the same elevation above the sea. At the mouth of the Yellow Stone, in longitude 104° , the elevation of the Missouri River is about 2,000 feet. On the

Red River of the South, at a corresponding distance from the Mississippi, the elevation of the plain is very nearly the same. The central portion of the plateau, in long. 104° , is 5,000 feet above the sea. At Fort Benton, long. $109^{\circ} 45'$, near the Grand Falls of the Missouri, the elevation of the river bed is about 2,600 feet above tide. The same meridian prolonged passes but a short distance west of the Great Salt Lake, and over the elevated ranges which crowd the great basin between the Rocky Mountains and the Sierra Nevada.

The elevation of the plateau of the Rocky Mountains above tide water, at the several points crossed by the surveys for a Pacific Railroad, which are the lowest ascertained passes through the mountain ranges, are as follows:

Elevation of the plateau on 47th parallel,	5,200
" " " 42nd "	7,496
" " " 41st "	7,000
" " " 38th "	9,219
" " " 35th "	6,600
" " " 32th "	4,707

The lowest depression of the plain on the south is occupied by the Red River. This river issues from the base of the Llano Estacado, and flows almost due east to the Mississippi River. Its source is estimated by Capt. Marcy at 2,450 feet above the sea, the cliffs rising on either side some 800 feet to the level of the Llano. But as this is known to have an elevation of about 4,500 feet, the estimated elevation of the source of the river is probably 1,000 feet too low. On going south from this river, an elevation of 4,700 feet is reached between the waters flowing into the Colorado of Texas and the Rio Grande. On the other hand, it is not probable that the summit between the Upper Missouri and the Saskatchewan, east of long. 108° , is elevated 3,000 feet above the sea.

The direction of all the tributaries of the Mississippi, taking their rise in the Rocky Mountains, corresponds to the slope of the plain they traverse, with the exception of the Missouri. From its source, for fully one thousand miles by its meanderings, the course of this river is slightly to the north and east.

* Elevation of the base of a proposed tunnel.

Under the meridian of 102° , and in latitude $47^{\circ} 15'$, and on which are the sources of the Mississippi, the former takes a south-easterly course, and for more than a thousand miles has a direction very nearly parallel to that of the Mississippi. For this distance the two rivers are, on the average, about 350 miles apart. The Missouri, however, occupies a much higher elevation. This river descends at the rate of about 9 inches to the mile from Fort Benton to its mouth, a distance of about 2,800 miles. The rate of fall of the Mississippi, above its junction with the Missouri, to the Big Stone Lake is $5\frac{1}{2}$ inches to the mile. At Fort Pierre Chouteau, on the Missouri, in lat. $44^{\circ} 15'$, the elevation of the river is 1,456 feet above the sea, and about 750 feet above the Mississippi upon a similar parallel. The rate of the slope of the plain easterly, between the two rivers on the last named parallel is, consequently, at the rate of a little more than two feet to the mile, while its southerly slope is at the rate of 9 inches to the mile. At the mouth of the Kansas, about 400 miles from the Mississippi by the course of the river, and about 250 miles in a direct line, the elevation of the Missouri is about 320 feet above the Mississippi, and 725 feet above tide water. Below the mouth of the Kansas, the Missouri takes a course very nearly due east in obedience to the general easterly inclination of the plain it traverses.

The Missouri river, owing to the low depression of its bed as it issues from the Rocky Mountains, and to its wide meanderings, which distribute its total descent of 2,200 feet over a distance of 2,800 miles, is the only western tributary of the Mississippi that carries a navigable water line to the very base of the mountains. None of the other great rivers which drain their eastern slopes or the upper slopes of the plain are navigable, except for short distances above their mouths, and some of them not at all. The exceptions are the Red and Arkansas rivers, on their passage through a belt of territory lying immediately west of the Mississippi, in the states of Arkansas and Louisiana, which has an average breadth of about 275

miles. This belt, in all its features, presents a striking contrast to the general aspect of the territory under description. In it are embraced extensive mountainous and alluvial districts, which will be more fully noticed in another place. Through these the Arkansas and Red rivers find their way to the Mississippi, and are navigable to the western boundaries of the states named. West of these boundaries all the leading characteristics of the great plain assert themselves in all their force.

As might be expected, the slope of the great plain increases in degree as it is ascended. Between the mouth of the Kansas and the Mississippi rivers it inclines at the rate of about sixteen inches to the mile. On proceeding west, the rate increases, but not in a marked manner till about the 99^{th} meridian is reached. After crossing this, the ascent in the valleys of the Platte and Kansas rivers assumes an angle varying from four to ten feet to the mile. Under the same meridian a remarkable change in meteoric phenomena appears to take place, indicating conclusively that the western limit of fertile land, and of rain-fall sufficient for agricultural purposes, is reached.

The following statement will show the elevation above tide and above the Mississippi river, of the plain where the meridian of 99° is crossed by the several routes surveyed for a Pacific railroad, with its distance from and the rate of slope toward the river :

Parallel of	Feet above tide.	Feet above river.	Distance from river.	Rate of descent in ft. per mile.
Parallel of 47°	1,400	600	300	2.00
" " 41°	1,100	1,600	400	4.00
" " 39°	2,970	1,698	425	3.75
" " 38°	1,902	1,562	410	3.48
" " 36°	1,832	1,697	410	3.77
" " 32°	2,000	1,900	450	4.22

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The following statement shows the summit of the western edge of the plain above sea at the lowest mountain passes, their elevation above the Mississippi river, their distances from the river by the several routes surveyed for

railroads, and the rate of their descent from the respective summits toward tide-water :

Parallel of		Elevation above sea.	Elevation above river.	Distance from river by the routes of the Pacific surveys.	Rate of slope toward the river, in feet per mile.
47°		5,200	4,400	1,137	4.66
"	42°	7,496	7,096	1,000	7.99
"	41°	7,409	7,000	930	7.09
"	38°	9,219	8,810	850	10.84
"	35°	6,705	6,509	854	7.89
"	32°	4,707	4,560	720	6.53

Notwithstanding the immense elevation of the plain, and the rivers that traverse it, the latter descend with pretty uniform currents for the entire course, and do not fall over successive terraces as does the St. Lawrence river on its way to the sea. As already stated, one of the most important consequences of the rapid slope of the plain described is its lack of navigable water-courses which so characterize, in a remarkable manner, other portions of the United States. A river having a slope greater than ten inches to the mile, has its current so accelerated as to destroy its banks. In such cases the water spreads over a large surface, and the current is a constant succession of rapids and pools. The water in the Platte is only a few inches deep at ordinary stages, and at no time has it sufficient draft to float a steamboat. From the want of navigable water-courses the great plain, if fertile, would possess, at the present time, but little value, in consequence of the cost of sending its produce to a market.

Another characteristic of the region described is the uniformity of its aspect. Its great slopes are not perceptible to the eye, but must be shown by instruments. Those into which the surface is diversified, are so gentle that it may be traversed by wagons in almost any direction. It is without wood, as a general rule, much of it without water.

From the most authentic data, the western limit of arable land is the meridian of 99°. West of that it may eventually be valuable for grazing; but there is not probably sufficient rain-fall for agriculture over any portion of the country west of the meridian named, and east of

the crest of the Sierra Nevada and Cascade range of mountains in long. 119°, embracing an area of at least 1,500,000 square miles. The range of mountains last mentioned operate as an effectual barrier to the further progress inland of the currents of air laden with moisture from the sea, consequently nearly all the territory between the Rocky Mountains and the Sierra Nevada and coast ranges is little better than a rainless desert. The small amount of moisture that finds its way from the Gulf of Mexico and the Atlantic, so far inland as the upper portion of the plains, is not condensed upon them, but upon the lofty summits of the Rocky Mountains. None of the rivers descending from them perceptibly increase their volumes in the upper portion of the plains. There is probably as much water in the Mississippi, at the mouth of the Yellowstone, as at a point 1,000 miles below. This river does not discharge as much water for the year as the Ohio, though it drains an area nearly twice as extensive—a conclusive proof of the small amount of rain-fall upon the territory it drains.

Another cause, which, with a sufficient rain-fall, would render the whole extent of the plain west of the meridian of 99° unfit for agriculture, are the saline and alkaline matters found in the soil. Upon the meridian of 99°, near the northern boundary of the United States, is Devil's Lake, a large body of salt water having probably no outlet. Upon the Red River of the South, under the same meridian are found immense deposits of gypsum and salt, and with them a sterile and inhospitable country. The *Mauvaises Terres*, in latitude 43°, is nearly in the same longitude. It is probable that the whole plain west of this meridian is so charged with alkaline matter as to render it entirely unfit for cultivation.

The most striking exception to the level and treeless expanse, which so generally characterizes the great plain, is the belt of country already referred to, lying south of the Missouri River, and immediately west of the Mississippi. In this region are the Ozark Mountains, which enter the state of Arkansas from the south-

west, pass through it in a north-easterly direction, and extend nearly to the south bank of the Missouri River. The highest elevation attained by these mountains is probably in no case more than 1,500 feet above the level of the sea. They can hardly be said to constitute a well defined range. They are cut completely in two by the Arkansas river. They present bold and rugged outlines, with their bases only slightly elevated above the general level of the country. It is in these mountains that are the deposits of iron, lead, copper, and coal, for which the states of Arkansas and Missouri are so justly celebrated.

Another exception to the uniform characteristics of the great plain are what are termed the sunken lands of northern and eastern Arkansas, caused by the great earthquake of 1812. Large tracts disappeared from the surface, their places being supplied by pools and lakes. But such exceptions are rather to be noted by themselves, than to form a part of a paper touching only the leading outlines of the geography of the country.

Another exception to the rule stated is the low land, or what may be termed the Delta of the Mississippi, which has been formed by deposits of vegetable and earthy matter by the river. This Delta may be said to commence a short distance below the mouth of the Ohio. Upon the Gulf of Mexico it has a breadth of nearly 200 miles. For its whole extent it is only slightly elevated above the river. Indeed no portion of Louisiana has an elevation of more than 500 feet above the sea. The Mississippi River at Vicksburg is elevated only about 100 feet above the sea. The elevation of the Red River, near Shreveport, is ascertained to be 96 feet above the Mississippi at Vicksburg, or 196 feet above tide. Through the state of Louisiana the Red River has a fall at a rate not exceeding 4 inches to the mile. Its course, as is that of all the considerable rivers in the state, is southerly. Their rate of fall is very nearly that of the Red River, showing a similar inclination of different parts of the plain within this state. The rate of its descent eastward,

on the line of the Vicksburg and Shreveport Railroad, is ascertained to be 7 inches to the mile. From its source to the western boundary of Arkansas, the course of the Red River is very nearly due east. The rate of its descent from its source to its mouth, according to Capt. Marcy, is about 14 inches to the mile. It is probably considerably greater. It has through its whole course a pretty uniform current, unbroken by falls of any considerable magnitude.

With the exception of Florida, Louisiana has a less elevation above the sea than any other state, a considerable portion being less than 100 feet above tide water. The highest land crossed by the line of the Shreveport Railroad is only 400 feet above the sea. It is not probable that the highest elevations in the state exceed this by more than 100 feet. The state of Arkansas presents a double contrast to the general uniformity of the great plain in its alluvial districts, which are similar to those of Louisiana, and in a rough mountainous district already briefly referred to. Another contrast presented by both states are their generally wooded surfaces. In the state of Arkansas, its great river flows nearly east, and has a fall of about 7 inches to the mile. The plain falls to the Mississippi River in a direct easterly course at nearly double this rate. The Arkansas is navigable to Fort Smith during periods of floods, but owing to long droughts, which frequently prevail, it cannot be relied upon for commercial purposes, and will be superseded by railroads as soon as they are constructed.

With regard to the meteorological conditions of the great plain, the data possessed is obtained from observations, confined to a very small portion of it. These are confined to military stations. Those made in the state of Arkansas, and in the eastern portion of the Indian reserves, show an amount of rain-fall nearly equal to that on the Mississippi River upon similar parallels. The Cross Timbers in longitude 99° seem to be the western boundary of abundant rains, and mark distinctly the dividing line between fertile and sterile soils.

The rain-fall and temperature for the year, as well as for the four seasons, is shown in the following table:

Places of observation.	Latitude north.	Longitude west.	Elevation, feet.	Mean temperature for the seasons.— (Fahrenheit's Thermometer.)				Rain-fall for the season and year.					
				Year.	Spring.	Summer.	Autumn.	Winter.	Year.				
Fort Dodge.....	43° 00'	94° 03'	780	44.4	73.8	60.8	20.8	47.4	7.92	8.19	8.19	3.06	27.32
Fort Leavenworth.....	39° 21'	94° 44'	860	53.8	74.1	63.7	29.6	52.8	7.97	12.24	7.33	2.75	30.29
Fort Kearney.....	40° 38'	98° 57'	2,100	46.8	71.5	49.3	23.0	47.7	10.80	12.06	3.82	1.31	27.97
Fort Laramie.....	42° 12'	104° 47'	4,470	46.8	71.9	49.3	23.1	50.1	8.69	6.70	3.96	1.53	19.98
Fort Atkinson.....	37° 47'	100° 14'	2,380	54.2	77.7	54.6	32.1	54.6	13.68	7.15	12.05	2.13	35.01
Fort Arbuckle.....	33° 27'	97° 07'	1,000	61.7	79.9	62.2	40.8	61.6	8.15	8.98	8.96	4.54	30.57
Fort Belknap.....	33° 08'	98° 48'	1,600	64.9	80.9	65.1	45.0	64.0	7.09	6.31	6.86	1.75	22.00
Fort Worth.....	32° 40'	97° 25'	1,100	63.1	80.4	63.4	45.2	63.5	14.50	8.80	9.49	8.07	40.87
Fort Chadbourne.....	31° 38'	100° 06'	2,560	64.3	76.8	62.5	45.9	62.4	8.62	10.46	8.99	3.91	31.88
Fort Graham.....	31° 56'	97° 26'	800	65.0	82.4	66.8	48.7	65.7	11.91	6.02	9.37	11.91	40.58
Fort Croghan.....	30° 40'	98° 31'	1,000	66.9	80.6	67.0	49.4	65.7	11.61	7.80	8.24	8.91	36.56
Fort Jessup.....	31° 33'	98° 32'	260	66.8	81.3	66.2	51.0	66.3	13.68	10.94	9.74	11.49	45.85
Fort Towson.....	34° 00'	96° 33'	450	62.4	79.1	61.3	43.9	61.7	15.55	14.36	12.23	9.84	51.08
Fort Washita.....	34° 14'	96° 38'	700	62.2	79.3	63.2	44.1	62.2	13.19	11.27	10.78	6.42	41.66
Fort Gibson.....	38° 47'	96° 10'	560	61.0	79.4	61.7	41.0	60.8	11.38	9.68	9.25	6.15	36.46
Fort Smith.....	36° 23'	94° 29'	460	61.3	77.6	60.1	41.1	60.0	12.46	13.03	9.93	6.66	42.10
Fort Scott.....	37° 45'	94° 36'	1,000	54.8	74.9	55.3	33.0	54.5	12.57	16.37	8.37	4.79	42.12

DEPARTMENT OF STATISTICS.

AMERICAN AGRICULTURE.*

MR. PRESIDENT AND GENTLEMEN:

IN accepting the honor you have conferred upon me in the Chairmanship of "the Agricultural Section of the American Geographical and Statistical Society," it becomes my duty in opening the Section this evening, to say a few introductory words upon this branch of the Society's labors.

I propose to glance over the field which the Agricultural Statistics of our country are destined to embrace, and refer cursorily to some of the aspects in which, looking at the past, and the present, and onward to the future, they commend themselves to all classes of our reflecting countrymen. The facts which they develop concern alike consumers and producers, farmers and planters, manufacturers, and all engaged in commerce, whose varying interests are so closely and inseparably allied. They have a common interest for all who watch the march of our Republic, and record its progress; and above all they deserve the careful study of legislators and statesmen, who are constantly being called from private life, to frame its laws, to shape its policy, and to determine its destiny.

Most of the governments of Europe have been greatly in advance of us in their appreciation of the value of statistics. England, France, Belgium, and Austria, have for some years applied themselves earnestly to statistical investigation; and in those countries the truth is becoming generally recognized, that the world at large has an interest in the statistics of every nation, as tending to develop natural laws of universal concern to mankind.

In England, the labors of the Statistical Society, whose elaborate and most valuable pub-

* A Statistical View of American Agriculture: its home resources and foreign markets, with suggestions for the schedules of the Federal Census of 1860. An address delivered, at New York, before the *American Geographical and Statistical Society*, on the organization of the Agricultural Section. By John Jay, Esq., Chairman of the Section and Foreign Corresponding Secretary of the Society. Published by D. Appleton & Co., New York. (Abridged.)

lications enrich our Library, have aroused the attention of the people and of Parliament to the truth, that the science of politics finds in the statistical element its most solid foundation.

"Statistics," remarks M. Le Ray, "are to politics and the art of governing, what anatomy is to physiology in the study of the human body; the observation of the stars to astronomy; the study of species of animals, plants, and minerals to the natural history of the globe; the analysis of the body to chemistry; experimental physics to natural physics. The statesman who pretends to govern, without knowing the important facts which interest society, makes a more fruitless attempt, than the philosopher who should propose to make a general classification of the beings which compose the three kingdoms of nature, without knowing the essential characteristics of them."

The French Minister, in his opening address at the International Statistical Congress at Paris, in 1855, thus touched upon the philosophy of Statistical Science:

"Whether statistics prove the development of population, its increase or decrease, its riches or its misery, or whether they register the elements of production and of consumption among nations, they tend always—and that is their chief merit—to discover and develop all the general laws which may assist to render men better and happier."

This remark, although predicated of statistical science generally, is equally applicable to that part of it which pertains to agriculture, and which has been hitherto so singularly neglected.

Commerce and manufactures, by their "consolidation of power and concentration of wealth," have commanded to a far greater extent the attention of government. But the census shows beyond the possibility of error, that even now, and without reference to its future developments, agriculture is the largest national interest of this Republic; involving more than any other branch of industry, the wealth and the welfare of the country, and the labor and the happiness of the greatest number.

It is natural that such an interest should in every enlightened community establish among its members a common ground of thought and action, however otherwise they may be divided.

Thus we see in England and in the United States, amid scenes of party excitement, the warmest political opponents meeting cordially on the same platform at agricultural exhibitions; and in France at the great "Exposition" of 1855, the same pleasing spectacle was exhibited.

Looking at the employment of the free male population of the United States over fifteen years of age, (numbering, in 1850, 5,371,876,) we find that the population engaged in agricultural pursuits was 2,400,583 or 44.69 per cent; while the total number engaged in commerce, trade, manufactures, mechanics, arts, and mining, was only 1,596,265, or 29.72 per cent.

These proportions differ materially from those of Great Britain, where the census in 1851, returned the persons engaged in commerce, trade, mining, and manufactures, at 3,748,074 or 38.19 per cent. of the whole population, 20 years of age and upwards, and those engaged in agriculture at only 1,576,081 or 16.1 per cent.

Looking beyond the number of individuals employed in American agriculture, to the amount of capital invested in it, you will find it represented in 1850 at five billions of dollars, and that represented by all other branches of industry at less than one billion, giving to agriculture more than five-sixths of the whole; and although these figures may be but an approximation to the truth, the proportions are probably correct.

Agriculture, by its products, adds to the wealth of the country some sixteen hundred millions per annum, and in the State of New York, where the assessed value of real estate is \$1,107,272,715, notwithstanding the enormous wealth of the metropolis, the agricultural interest pays *four-fifths* of the taxes.

Prof. J. F. W. Johnston, in his lectures on agricultural chemistry, says, that *nine-tenths* of the fixed capital of all civilized nations is embarked in agriculture.

With these figures before us of the comparative population and wealth devoted to agriculture, we can appreciate without effort the truth of the remark made by Mr. Webster, in his well-known agricultural address at Boston, on his return from England.

"No man in England is so high as to be independent of this great interest, no man so low as not to be affected by its prosperity or its decline. The same is true, eminently, emphatically, true with us. Agriculture feeds, to a great extent it clothes us; without it, we should not have manufactures, we should not have commerce. They all stand together like pillars in a cluster, the largest in the centre; and the largest is agriculture."

Apart from the general rule, that the agricultural wealth of a country is undoubtedly the first test of its internal resources, and the condition of its people, extra-territorial causes seem to be combining to give an unusual and increasing importance to the agricultural products of America.

The increase of population on the Eastern Continent, beyond the capacity of production, is investing the question of food with a significance that never belonged to it before. Consumption has there overtaken production, and henceforth, in England, France, Belgium, Holland, and a great part of Germany, the *food question* will take precedence of all others, as the regulator of commerce, and entitled to the first attention and the wisest treatment on the part of government.

In England, the turning point at which consumption overtook production, is said to have been in 1824, and from that time, two causes are held to have been constantly increasing the disproportion. The first of these, the increase of the population enlarging the consumption of breadstuffs, and the second growing out of the first—the demands of that population in part, for animal food, calling for a larger supply of cattle for the butcher, and consequently for a larger breadth of grazing and arable land for the production of green crops to rear and food them.

Upon the political importance of the Bread question in Europe, it is not necessary to enlarge. It is a matter within the personal knowledge of the present generation. The famine of 1847, in Ireland alone was attended by the loss of half a million of lives.

To the existence and power of the French Government, as one of their own writers has remarked, the mildew on an ear of corn, or the *oidium* on a bunch of grapes, are of more vital consequence than the splendor of imperial jewels, or the marvels of a thousand handicrafts. Whatever in our day cuts off the small profits of the industrial classes in Europe, or threatens multitudes with starvation, strikes at the stability of the political institutions of the land, and wields a mighty influence whether for evil or for good.

The very existence of thrones may be affected—indeed some think their existence has been determined, by causes apparently insignificant as the rot in the potatoe, or the weevil in a grain of wheat.

This overplus of population and deficiency of food in Europe, is of such recent origin, and as yet so slightly felt, that, as a nation, we have hardly begun to realize that it is to be of permanent continuance. But European economists recognize and appreciate the fact, that an inevitable and increasing demand for food, with an insufficient and diminishing home supply, will give henceforth to the Bread question, an immense political as well as moneyed significance; and the sufficiency of each successive crop at home and abroad, to satisfy the wants of the people, within the limits of their capacity to purchase, is become a question of constantly recurring and earnest speculation.

The contemplative statesmen of Western Europe, especially of England, foresee that with a limited area, and an increasing population, the time is at hand when, despite every effort to postpone it, by improved cultivation in which England now leads the world, their own productions will be more and more inadequate to supply the needs of their people, and the failure of a single harvest, according to an

English writer, might be naturally followed by war, famine and disease.

A brief century ago a very different state of things existed. In 1756, M. D'Anqueille, a French political economist and statesman, remarked that "England could grow corn enough in one year to supply herself for four."

Now, England is said to import food annually to the amount of some forty-five millions sterling, in corn, wheat, barley, oats, beans, meal, and flour; besides live animals, meat, cheese, and butter; and her population is increasing at the rate of one thousand a day.

The contrast between *now* and *then* is the more remarkable, when we remember that England is estimated to have three times as much land under cultivation as when D'Anqueille wrote, and that the ratio of her crops to the acre is doubled, if not trebled.

In France, despite the efforts of government to secure for the people sufficiency of food, the scientific researches of M. Payen, of the French Institute, on the public alimentation of France, confirm the inferences drawn by M. de Lavergne from the condition of the French peasantry. The nation, it is said, *have not enough to eat*, even to supply the natural wants of the human frame.

The official report of the products of the recent Universal Exposition of France, in dwelling upon the agricultural ability of the empire to support its population—referring to the fact that France has raised in good years 97,000,000 hectolitres of wheat, which represents the sustenance of 32,000,000 of individuals, added, "and there are unfortunately more than 4,000,000 of our compatriots who are not in the habit of eating bread." Indeed it has been broached as an interesting question how far the physical deterioration of the standard of growth in parts of the French Empire is the result of an inadequate supply of nutritious food. Some plausibility is given to this suggestion, by the statement that the number of conscripts who are rejected on account of deficient health, strength, and stature, is constantly on the increase. Forty per cent are said to be turned back for that cause, and although since 1789,

the standard has been three times reduced, as large a proportion of the conscripts is below the required height (five feet two inches,) as before the changes, showing, as the late Professor Johnston remarks, how closely the discussion of agriculture is connected with that of the most profound social evils. The importance and dignity of the entire subject become yet more striking in view of the great truth so forcibly alluded to by Lord Stanley in his Address on Public Health, "That whatever exception may be found in individual instances, when you come to deal with man in the mass, physical and social decay necessarily go together."

In Spain, whose central table-lands are reckoned among the finest wheat growing districts in the world, the culture is most rude and imperfect, and some tracts are partly overgrown with broom and daphne.

Throughout Prussia, Austria, Belgium, Holland, Bavaria, and most of the minor German States, the increase of population is attended not with an increase, but rather with a decrease of the breadth of land devoted to cereal produce. In France, that decrease has been made greater by the absorption of land in the cultivation of the Silesian sugar-beet, and a similar decrease is found in Western Europe, with the exception of Belgium and Holland, which are grazing rather than agricultural countries, and are themselves purchasers of foreign grain. And excepting also Russia, which is making extraordinary efforts, involving no slight revolutions, social and political, to maintain its markets, and to secure its agricultural supremacy. That mighty empire, with a population of sixty-five millions of souls, and embracing in Europe, Asia, and America, one sixteenth of the world, presents many prominent points of similarity as well as contrast to the United States, which, without anticipating the rivalry that may hereafter arise between the two countries, invest with a peculiar interest for our own countrymen, the newly developed features of its imperial policy, and especially those which relate to the social elevation of its laborers and the improvement of its modes of culture.

Agriculture, in the continental states, is at a low ebb, and by no means keeps pace with the increasing requirements of the population.

For the supply of their wants, annually becoming greater, they begin to look in great part to the American Continent. "One fact," says the *Mark Lane Gazette*, "is clear, that it is to Western America that we must in future look for the largest amount of cereal produce."

I have permitted myself, gentlemen, to dwell for a few moments upon the subject of a foreign demand for breadstuffs, for the reason that although that demand is of recent origin, and is still limited both in extent and degree, it would seem that in the natural order of things that demand must not only increase throughout the whole of Western and in parts of Eastern Europe, but extend to other quarters of the globe, and form a necessary feature of increasing prominence, in every intelligent view of the agricultural aims and resources of the United States.

While recognizing the truth that lies at the basis of Statistical Science, and that should never be lost sight of in an association like this, that fancy and theory are inadmissible, and that Newton's motto, "*Hypotheses non fingo*," should be our guiding rule, we cannot forget, that while England and France count their ages by centuries, our Republic is yet in its infancy, and that, in a general glance such as we are about giving to the agriculture of our young land, the view would be meagre and incomplete, were we not to notice the surrounding circumstances, that are beginning to shape its character and influence its growth.

With the facts before us to which I have referred, in regard to the existing demand for bread in Europe, let us now look at the general capacity of our country for affording a supply.

The number of square miles contained in the area of the United States of America is within a fraction of three millions (2,963,666,) somewhat more than one-third the area of North America, exclusive of the West Indies, and nearly double the area of all Europe, excepting Russia.

Two countries in either hemisphere approach the United States in area; the one Russia, containing twenty-one hundred thousand square miles; the other Brazil, having twenty-seven hundred thousand square miles.

The aggregate population of the United States has increased from 3,929,827, in 1790, to 23,191,876, in 1850. The estimated population for the present year, 1858, is little over twenty-nine millions, now for the first time approximating that of the United Kingdom. According to the ratio of increase from 1840 to 1850, the population in 1900 would be one hundred and seven millions. The annual increase from 1790 has been four times as great as Russia, six times as great as Great Britain, nine times as great as Austria, ten times as great as France.

In 1850, the density of population for the existing territory of the United States was 7.90 persons to the square mile. In the New England States, the density was 41.94 to the square mile. In the middle states 57.79, while California and Texas together had less than one person to the square mile. When the increase of our native and foreign population shall invest with the density of New England the whole territory of the United States, its population will amount to one hundred and twenty-three millions. With the density of the middle states, of 57.79 to the square mile, it would amount to one hundred and seventy millions.

The density of Spain (78.03,) would make it two hundred millions. That of France (172.74,) five hundred million. That of Great Britain, in 1851, (332.00,) six hundred and sixty millions, while the density of Belgium (388.60,) were it possible to support such a population on this continent, would give us eleven hundred and fifty millions. Such a population, however, or anything approaching to it, is a thing impossible in the United States, for the reason that a large portion of its territory is a barren waste, incapable of tillage. Such is the character of the space between the 99th meridian and the Rocky Mountains, denominated "The Great American Plain," and the space from the Rocky Mountains to the Pacific, with the ex-

ception of the rich but narrow belt along the ocean, may also be regarded, in comparison with other portions of the United States, as a wilderness unfitted for the use of the husbandman.

I do not mention these figures, with any intent of digressing from the subject before us, into idle speculations on the future destiny of the Republic, based upon the extent of its area, but to direct your attention to the fact so intimately connected with a just view of American agriculture, that making ample allowance for the unproductive parts of our territory, looking only to those parts whose fertility is known, the country is capable of producing a vast excess of food over the quantity required for home consumption by its present and immediately prospective population, even with all the immigration that a wisely directed governmental policy may induce; and that it must be in part the industrial mission of the United States for long years, it may, perhaps, be for centuries to come, to produce food for the consumption of foreign nations.

It may be said of America as it has been said of Great Britain, that she has a relative as well as an absolute existence; and this truth becomes very striking in this connection, when we look at her, not alone as the bountiful supplier of her own fast-increasing population, but as destined to become, in all human probability, above and beyond their wants, the greatest grain market in the world; ready to assist Europe on the one hand and Asia on the other. It grows more apparent when we consider not simply the large extent of her area, and the small density of her population, but the diversity of her climate, the fertility of her western prairies, her Mississippi Valley, her Atlantic and Pacific slopes, and regard at the same time the intelligence and energy of her farmers, her public schools, her agricultural associations, and her free press; the expanding influences of her institutions, and her commanding central position.

I need not enlarge further upon the pre-eminent importance of American agriculture as a national interest that is destined to furnish the

bulk of our exports, nor of the statistics that pertain to its various branches.

The facts to which I have directed your attention, showing the wants of Europe and the capacity of America, are sufficiently conclusive on that point. But I may be allowed for an instant, before leaving this branch of our subject, to remind you that the increase of our exports is but one of the phases in which the subject is connected with the welfare of the nation.

Our national strength consists far less in the extent of our area than in the number, the youthfulness, the industry and moral qualities of our people.

These indicate our productive power, which is to be guided into the most profitable channels. Whatever assists us in the development and direction of these characteristics, under the most advantageous moral conditions, contributes to our national strength, prosperity, and happiness.

How far American agriculture, with its millions of acres yet unbroken, a population of thirty millions to feed, and a growing demand for breadstuffs in foreign markets, is calculated to aid that development, is a question to which I propose simply to allude, as one that will receive new light from each successive census, and from the increasing number of intelligent minds that will be engaged in scrutinizing and collating its returns, and in educing from them natural laws, marked by mathematical accuracy, and possessing almost the certainty of moral truth.

It may well be that those statistics shall assist us to solve the problem, at this time so momentous to the citizens of this metropolis, how we can most readily transplant the imported pauperism of our cities, to the prairies and valleys of the west; and enable us to convert a festering and dangerous mass of municipal corruption, into a healthful element of national prosperity.

It may well be, that by the successive returns of the census, great natural laws may be practically developed, that are as yet but par-

tially and theoretically discerned; and that moral and economic questions which have long puzzled the philosophers and philanthropists of both hemispheres, and that now perplex and confound our politicians, shall be resolved into the simplest elements of political economy, governed by rules, which, although based upon selfish motives, will be found wide-spread as human intelligence, and permanent as the principle of self-interest.

Statistics to be thus available must be complete, and in England they are quite conscious of the comparatively slight value attaching to desultory, fragmentary, isolated returns, educed for special purposes and deficient in unity.

It is now regarded as an axiom, that comparative statistics cannot content themselves with partial and uncertain observations, but must always repose on reality, and always submit to the law of numbers.

Our learned foreign associate, Mr. Quetelet, who has introduced into the science of statistics, a new spirit of philosophic analysis, observes, that "All observation tends to confirm the truth of the proposition, that whatever concerns the human race, considered collectively, is of the order of physical facts. The greater the number of the individuals, the more completely does the will of individuals disappear, and allow the series of general facts which depend upon the causes by which society exists, and is preserved, to predominate. "We must admit," he remarks, "that on submitting to careful experiment unorganized bodies and the social system, we are unable to say on which side causes act in their effects with the greatest regularity."

Another of our foreign associates, Lord Stanley, early prominent among British statesmen, and who, I may say in passing, has vindicated his ancestral claim to greatness, not simply by his wisdom and industry in Parliament, but by the earnest and philosophic spirit he has exhibited in scientific and philanthropic efforts, gave, not long since, an admirable exposition before the London Statistical Society, of the

nature and objects of Statistical Science. Regarding it as dealing with man in the aggregate, and developing results that can be calculated with mathematical precision, and thus leading us, step by step, to the knowledge of the laws that govern the social system, Lord Stanley remarked, "When, therefore, in discussing social questions, we apply the statistical test, we are really doing nothing more than appealing from imagination to fact, from conjecture to certainty, from an imperfect to a perfect mode of observation."

Bearing in mind the necessity of universality and completeness in all statistical returns, to insure accuracy and certainty in our deductions from them, it is clear that the statistics of agriculture should comprise, as far as possible, all the conditions, proceeds and results of the agricultural industry of the country at a given time, and all the facts which may assist towards their proper appreciation in all their different aspects. For the performance of such a work throughout the length and breadth of a vast empire, it is obvious that the efforts of private associations, or even of local governments, are utterly unequal.

This is singularly exemplified by a glance at the disjointed and unequal action of the State governments on this subject.

In most of the States there is a census taken at varying intervals of two, four, six, seven, eight and ten years. In Connecticut, Kentucky, Maryland, North Carolina and Rhode Island, there is no regular state census.

In 1850 it was ascertained that in New Hampshire the last census was in 1783. In New Jersey there had been none in the present century; and in Vermont the last was in 1771. Massachusetts has taken the lead in the extent, accuracy and minuteness of her statistical investigations. The recent New York census of 1845, and that of 1855, prepared under the direction of the Hon. Joel T. Headly, Secretary of State, are probably the most complete of any. The legislative appropriations of this State, for geological and agricultural purposes, have been liberal. In Ohio, the state census

is taken every four years, with yearly returns of the acres in wheat and corn, and their yield.

Statistics are now recognized as the peculiar function of the State, in a sense in which no other science is so; and in the United States the Federal Government alone has the power and the opportunity to give it the abundance, universality and accuracy that are essential to enable the American statistician to avoid the errors that are constantly occurring in the calculation of mean results from an insufficient number of data, and without sufficient opportunity to eliminate and allow for disturbing causes.

In Europe there have been recommended by the recent statistical congresses as important accompaniments of an agricultural census, minute features, which, however desirable, will be for us, from the inevitable circumstances of our position, for a long time to come, impracticable. They include a plan of surveys, by which the entire territory is to be surveyed and mapped in a uniform manner, on a scale of about three inches to a mile, the scale commonly adopted in England, with the boundaries of counties and townships, the triangulation, the details of roads, and, where the lines are permanent, of farm and fields—fixing, by districts, the average value and character of the land, the higher types and values of the cultivation, the whole arranged with reference to ease of revision at stated periods. The scale of maps for villages and crowded districts, it has been suggested, might be fifty inches to the mile, with index maps, showing a considerable surface of the country, when minute detail is not required. I note the suggestion to show the thoroughness proposed in Europe, and as one which may, perhaps, be advantageously adopted for special purposes, in some parts of our own country.

I will now call your attention to what has actually been accomplished towards the statistics of American agriculture by the Federal government.

A general census has been taken in the United States every tenth year, beginning with 1790, in compliance with the provisions of the Federal

constitution, for the apportionment of representation and taxation among the States, according to their representative members; but until very recently the census has furnished few national data upon the prominent branches of American industry.

Our governmental statistics have had reference to population, to revenue, trade, commerce, and navigation. They have of late touched upon the moral, the social, the physical condition of the people; including religion, education, crime, and pauperism; while *agriculture* received little attention, until, in 1840, it was partially included in the Federal schedules for that year.

In the Census of 1850, one schedule out of six, more full in its details, was devoted to agriculture. These schedules were prepared by a special committee in the Senate, and they were assisted by valuable suggestions from our collaborer, Mr. Archibald Russell, whose services in this regard were publicly acknowledged, and who thus in advance aided in preparing the way for the labors of this association, whose infancy he so faithfully nursed, and whose maturer course by Sections, he has within a few months so auspiciously inaugurated.

The materials gathered in these Census, especially the last, despite the errors and imperfections incident to the inception of so vast an undertaking, afford a most excellent basis for future comparison; and indicate the respectful attention which agricultural statistics must henceforth claim at the hands of the government, stimulated as they will be by popular pressure from without, by the demands of the farmers of the United States, recognizing at last in agriculture a branch of industry not inferior to commerce or to manufactures, but one far surpassing them both in extent and importance; the great overshadowing interest of the nation, by which all others thrive, and which has the right to demand the constant, chiefest, and most enlightened regard, at the hands of their Senators and Representatives in Congress.

[TO BE CONTINUED.]

STATISTICS OF MANUFACTURES IN THE UNITED STATES.

The following is an abstract or general summary from the Digest of the Statistics of Manufactures, which has just been completed in accordance with an act of Congress. While this table presents only the general results, the Digest itself develops the condition of every branch of manufacturing industry in 1850, and will doubtless attract a large share of public attention, as presenting authentic information respecting the manufactures of all the States in that year:

States.	No. of Estab- lishments.	Capital	Cost of Raw Material.	Male hands.	Female hands.	Cost of labor.	Value of product.
Alabama	1,026	\$3,450,606	\$2,224,960	4,397	539	\$1,105,824	\$4,528,876
Arkansas	261	305,015	215,789	812	30	158,676	537,908
California	1,003	1,006,197	1,201,154	3,094	....	3,717,180	12,862,522
Connecticut	3,482	23,890,348	23,589,397	31,287	16,483	11,695,230	45,110,102
Delaware	531	2,978,945	2,864,607	3,237	661	936,684	4,649,296
District of Colum'a	403	1,001,575	1,405,871	2,036	534	757,584	2,690,258
Florida	103	547,060	220,611	876	115	199,542	668,235
Georgia	1,522	5,456,482	3,404,917	6,650	1,718	1,709,664	7,082,075
Illinois	3,162	6,217,765	8,959,327	10,066	493	3,132,336	16,534,272
Indiana	4,392	7,750,402	10,369,700	13,748	692	3,728,844	18,725,133
Iowa	522	1,292,875	2,356,681	1,687	20	373,016	3,551,783
Kentucky	3,609	11,810,462	12,165,075	10,576	1,900	5,106,048	21,710,212
Louisiana	1,008	5,032,424	2,459,508	5,468	750	2,033,928	6,779,418
Maine	3,974	14,599,152	13,553,144	21,853	6,167	7,485,688	24,661,057
Maryland	3,725	14,664,450	17,394,436	22,678	7,483	7,385,832	32,591,892
Massachusetts	8,259	83,357,642	85,856,771	96,261	69,677	39,784,116	151,137,145
Michigan	2,023	6,563,660	6,136,328	8,990	354	2,716,124	11,169,002
Mississippi	947	1,815,820	1,275,771	3,046	108	771,528	2,912,068
Missouri	2,923	8,576,607	12,798,351	14,880	928	4,692,648	24,324,418
N. Hampshire	3,211	18,242,114	12,745,466	14,103	12,989	6,123,876	23,164,503
New Jersey	4,106	22,183,580	21,990,236	28,547	8,762	9,202,680	39,711,206
New York	23,553	99,904,403	134,655,674	147,737	51,712	49,131,000	237,597,249
N. Carolina	2,587	7,224,745	4,602,501	10,630	1,704	1,784,604	8,861,025
Ohio	10,622	29,019,538	34,678,019	47,054	4,437	13,467,156	62,691,279
Pennsylvania	21,605	94,473,810	87,206,377	124,688	22,078	37,163,322	155,044,910
Rhode Island	853	12,923,176	13,189,909	12,837	8,044	5,008,656	22,093,258
S. Carolina	1,429	6,053,265	2,787,534	5,992	1,074	1,127,712	7,045,477
Tennessee	2,888	6,527,739	5,116,886	11,080	954	2,247,492	9,725,608
Texas	309	539,290	394,642	1,042	24	322,368	1,164,538
Vermont	1,849	5,001,377	4,172,552	6,894	1,551	2,202,468	8,570,920
Virginia	4,740	18,109,143	16,101,131	25,790	3,320	5,433,476	29,602,507
Wisconsin	1,262	3,382,248	5,414,931	5,798	291	1,712,496	7,293,069
Minnesota	5	94,000	24,300	63	....	18,547	58,300
New Mexico	23	68,300	110,220	81	....	20,772	209,010
Oregon	52	843,600	809,560	285	....	388,620	2,236,640
Utah	14	44,400	337,381	51	....	9,984	291,220
Total	121,993	\$525,149,108	\$554,783,917	713,154	225,491	\$232,957,440	\$1,010,628,779

Statement of the quantity of Iron and Steel imported into the U. States during the fiscal years of 1856, '7, & '8.

ARTICLES.	1856.		1857.		1858.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Bar iron, cwt.	2,163,449	\$5,252,785	1,734,041	\$4,423,935	1,314,628	\$3,318,913
Rod iron	193,820	478,523	315,735	809,901	167,709	426,499
Hoop iron, lbs.	13,223,639	345,004	12,070,543	324,675	9,519,581	473,326
Sheet iron	31,387,353	814,342	35,047,576	1,082,380	29,523,002	945,073
Pig iron, cwt.	1,180,239	1,171,085	1,035,882	1,004,742	837,717	789,949
Old and scrap iron	447,769	185,112	165,006	111,689	145,153	87,113
Railroad iron	3,109,916	6,179,280	3,566,107	7,455,596	1,514,905	2,987,576
Wire, cap and bonnet, lbs.	155,376	4,892	162,914	6,168	174,067	6,900
Nails, spikes and tacks ..	2,292,696	127,879	3,550,329	188,756	1,483,697	100,481
Chain cables	15,850,788	485,568	9,874,762	293,124	5,246,722	155,408
Anchors and parts	921,123	39,856	842,828	32,980	190,109	8,072
Anvils and parts	960,809	46,828	1,173,877	67,926	800,620	45,275
Manuf. of iron and steel ..	.....	6,810,685	.....	7,521,625	.....	5,360,343
Steel, cwt.	271,079	2,538,323	292,154	2,633,614	214,317	1,873,111
Totals		\$24,580,262		\$25,954,111		\$16,328,639

STATISTICS OF AMERICAN STATES.

NO. 2.

REPUBLIC OF CHILE.

Lat. 24° 30' to 55° 59' S. | Populat'n (1854), 1,439,120.
 Long. 68° 56' to 74° 35' W. | Density, 5.76 to sq. mile.
 Area, 249,952 sq. miles. | Capital, SANTIAGO.

CONSTITUTION.

Executive.—President, elected by provincial colleges, the members of which (in numbers three times as many as the representatives in Congress) are elected by the people of the several departments. Should none of the candidates receive a majority of votes, then Congress chooses between the two having the largest numbers. The Presidential term is five years, commencing on the 18th of September. During his absence or disability, the Minister of the Interior exercises the executive power, with the title of Vice-President.

Administration.—1. Minister of Foreign and Internal Relations; 2. Minister of Finance, (*hacienda*); 3. Minister of War and Marine; and 4. Minister of Religion and Public Instruction. They are immediately responsible to Congress for every order of the President they may countersign.

Council of State.—All the ministers, two members of the High Court of Justice, an ecclesiastical dignitary, a general of the army, a chief of the Department of Finance, two ex-ministers, two ex-intendentes, &c.

Legislature.—A Congress composed of a Chamber of Deputies of one member for every 20,000 inhabitants, and a Senate of twenty members. Deputies are elected for three years, and Senators for nine years. Sessions annual, and limited in duration from 1st June to 31st August; but the President, with the consent of the Council of State, can convene Congress at any time. All native born qualified electors are eligible as members; and foreigners six years after being naturalized.

Conservative Commission.—On the day before the close of the ordinary session, the Senate elects seven of its members to compose the "Conservative Commission," whose functions continue until the next regular meeting, and whose duties are to watch over the constitution and laws that they be observed, &c.

Judiciary.—A Supreme Court at the capital; Courts of Appeal at Concepcion, Santiago, and La Serena; a Tribunal of Accounts; and in the provincial capitals, primary courts of civil and criminal jurisdiction, &c.

National Religion.—The Holy Apostolic Ro-

man Catholic. The church is under the direction of the Archbishop of Santiago, and the Bishops of La Serena, La Concepcion, and San Carlos de Chiloé. There are ecclesiastical courts in each of the dioceses.

Local Governments.—Provinces are governed immediately by intendentes; departments by gobiernos; sub-delegations by sub-delegates, and districts by inspectors; and each have their proper courts of justice, financial officers, &c.

PRINCIPAL MOUNTAINS AND PASSES IN CHILE.

Names.		Lat. S.	Long. W.	Hgt., ft.
Portezuelo Come				
Coballo	Andes....	27° 36'	69° 20'	14,521
Cordelera de Dona Ana.....	"	29° 51'	69° 52'	13,431
Portezuelo Dona Ana .....	"	....	..	14,849
Cordelera de la Laguna	"	30° 30'	69° 23'	15,575
Aconcagua	"	32° 28'	69° 57'	22,301
Compana de Quillota	Cordilleras.	32° 57'	71° 06'	6,053
Cumbre Pass		32° 49'	70° 07'	12,488
Joncal	Andes....	33° 05'	69° 48'	20,368
San Francisco	"	33° 12'	70° 12'	16,998
Cerro Amarillo ..	Cordilleras.	33° 18'	70° 54'	7,316
Cerro del Plomo ..	Andes....	33° 19'	70° 07'	17,825
Tupungato	"	33° 22'	69° 51'	22,450
Cuesta Prado	Cordilleras.	33° 25'	70° 50'	6,083
La Vinilla	"	33° 26'	71° 14'	5,368
Portillo, East Pass	Andes....	33° 35'	69° 46'	14,315
Portillo de los Pinquenes .....	"	....	..	13,362
San Jose	"	33° 42'	69° 51'	18,150
San Pedro Nolasco	"	33° 46'	70° 15'	10,952
Horcon de Piedra	Cordilleras	..	..	7,313
Aculeo	"	33° 55'	70° 50'	4,888
Cerro de Alhue ..	"	33° 59'	70° 54'	7,332
Crus de Piedra ..	Andes....	34° 12'	70° 03'	17,126
Maypu	"	34° 17'	69° 43'	17,664
Descabezado	"	35° 00'	71° 03'	13,100
Cerro Coligual ..	Cordilleras.	36° 50'	72° 15'	807
Volcano de Antuco	Andes....	37° 07'	71° 02'	9,245
Volcano de Llayma	"	38° 50'	72° 03'	...
Volcano de Villa Rica	"	39° 14'	71° 57'	16,007
Cuesta Paragudhue	Cordilleras.	40° 02'	73° 15'	511
Volcano de Osorno	Andes....	41° 09'	72° 36'	7,550
Volcano Minchinmadom	"	42° 48'	72° 31'	8,000
El Corcovado	"	43° 12'	72° 50'	7,510
Yanteles	"	43° 29'	72° 48'	8,030

PRINCIPAL LAKES.			
Lakes.	Provinces.	Lakes.	Provinces.
Carisno.....	Coquimbo.	Totoral.....	Maule.
Toro.....	"	Laja.....	Concepcion.
Inca.....	Aconcagua	Gualletue.....	Arauco.
Yeso.....	Santiago.	Villa-Rica.....	Valdivia.
Mapocho.....	"	Rinihue.....	"
Batuco.....	"	Huanchue.....	"
Bucalemu (salt).....	"	Calafquen.....	"
Aculeo.....	"	Ranco.....	"
Cauquenes.....	Colchagua.	Puychus.....	"
Taguatagua.....	"	Rupanco.....	"
Las Garzas.....	Talca.	Esmeralda.....	"
Mondaca.....	Maule.	Llanquihue.....	"

PRINCIPAL RIVERS.			
Names.	Province.	Month.	
Copiapo.....	Atacama.....	Lat. 27° 17'	
Huasco.....	"	28° 24'	
Coquimbo.....	Coquimbo.....	29° 52'	
Limari.....	"	30° 41'	
Chuapa.....	"	31° 42'	
Petorca.....	Aconcagua.....	32° 28'	
Aconcagua.....	"	32° 56'	
Maypu.....	"	33° 39'	
Rapel.....	Santiago.....	33° 55'	
Mataquito.....	Colchagua.....	34° 49'	
Maule.....	Talca and Maule.....	35° 19'	
Itata.....	Concepcion.....	35° 58'	
Biobio.....	"	36° 42'	
Carampangas.....	Arauco.....	37° 16'	
Levu.....	"	37° 38'	
Imperial.....	"	38° 47'	
Tolten.....	Valdivia.....	39° 09'	
Valdivia.....	"	39° 51'	
Bueno.....	"	40° 12'	

BAYS AND HARBORS.

Ports of Entry.—Valparaíso, Coquimbo, Huasco, Copaipe or Caldera, Talcahuano, Constitución, Valdivia, Ancud, Bulnes.

Other Ports.—Topocaima, Vichuquen, Bodegas, Papudo, Pichidangue, Conchali, Zapallar, Tongoi, Totoralillo, Chanaral, Herradura, Pagonales, Animas, Barranquillas, Penco, Lirquen, Tome, Colcura, Rio Bueno, San Miguel.

CIVIL DIVISIONS OF CHILE.

Provinces.	Departm'ts.	Parishes.	Subdelegat's.	Dists.
Atacama.....	4	3	34	120
Coquimbo.....	5	12	63	305
Aconcagua.....	5	9	40	265
Santiago.....	4	26	40	170
Valparaíso.....	3	9	29	144
Colchagua.....	3	21	33	120
Talca.....	2	6	23	99
Maule.....	5	14	33	156
Nuble.....	2	5	25	114
Concepcion.....	6	17	33	193
Arauco.....	3	6	20	109
Valdivia.....	3	4	18	58
Chiloe.....	10	10	27	133
Llanquihue (Col.)	1	1	2	13
Magallanes.....	1	1	..	..
Total.....	57	144	420	1,999

POPULATION OF PROVINCES.

Provinces.	Males.	Females.	Total.
Atacama.....	30,826	19,864	50,690
Coquimbo.....	53,997	56,592	110,589
Aconcagua.....	54,152	57,352	111,504
Santiago.....	133,614	138,865	272,499
Valparaíso.....	57,976	58,067	116,043
Colchagua.....	92,395	100,309	192,704
Talca.....	38,534	40,905	79,439
Maule.....	75,291	86,954	156,245
Nuble.....	50,048	50,744	100,792
Concepcion.....	54,930	55,361	110,291
Arauco.....	22,235	21,231	43,466
Valdivia.....	15,617	13,676	29,293
Chiloe.....	31,176	33,410	61,586
Colonies.			
Llanquihue.....	2,053	1,773	3,826
Magallanes.....	88	65	153
Total.....	712,932	726,188	1,439,120

Under 7 yrs. of age.....	151,722	143,205	294,727
7 to 15 ".....	162,706	149,377	312,083
15 to 25 ".....	135,346	157,304	292,650
25 to 50 ".....	204,578	213,166	417,744
50 to 80 ".....	56,080	60,195	116,275
80 to 85 ".....	567	671	1,238
85 to 90 ".....	512	562	1,074
90 to 95 ".....	939	1,233	2,172
95 to 100 ".....	244	325	569
100 and upwards.....	238	350	588

Single.....	497,439	481,811	979,250
Married.....	188,871	191,711	380,582
Widowed.....	16,754	45,518	62,272
Widowed Married.....	9,868	7,148	17,016

Can Read.....	123,437	70,416	193,853
Can Write.....	100,011	53,283	153,294

At Public Schools.....	12,029	2,828	14,857
At Municipal ".....	3,678	1,469	5,147
At Private ".....	5,879	2,939	8,818
Total at School.....	21,586	7,236	28,822

Natives of Chile.....	698,513	720,938	1,419,451
Foreigners.....	14,419	5,250	19,669

Population of Chile in 1832.....	1,010,336		
" " " 1848.....	1,119,802		
" " " 1854.....	1,439,120		

PRINCIPAL CITIES AND TOWNS.

Provinces.	Capitals, etc.
Atacama.....	Copiapo, Vallenar, Freirina, Caldera and Huasco.
Coquimbo.....	La Serena, Illapa, Combarbala, Ovalle, Elqui, Coquimbo, Tongoi, Totoralillo.
Aconcagua.....	San Felipe, Andes, Ligua, Petorca, Putaendo.
Santiago.....	Santiago, Melipella, Rancagua, Victoria, San Antonio.
Valparaíso.....	Valparaíso, Quillota, Casa-Blanca.
Colchagua.....	San Fernando, Rengo, Curico, Topocalma, Bichuquen, Llico, Tuman.
Talca.....	Talca, Molina.

Provinces.	Capitals, etc.
Maule	<i>Cauquenes</i> , Chanco, Constitucion, Parral, Quirihue, Curinape.
Nuble	<i>San Carlos</i> , Chillan, Bulnes.
Concepcion . .	<i>Concepcion</i> , Talcahuano, Penco, Lirquen, Tome, Colcura.
Arauco	<i>Arauco</i> .
Valdivia . . .	<i>Valdivia</i> , La Union, Osorno, Cruces, San Jose, Arique.
Chilo	<i>San Carlos</i> , or Ancud, Castro, Chacao.
Colonies.	
Llanquihue .	<i>Llanquihue</i> .
Magallanes .	<i>San Miguel</i> , Port Bulnes.

PUBLIC INSTRUCTION.

Institutions.	Number.	Students—	
		Males.	Females.
Colleges, National.....	15	1,980	....
“ “ Separate, for Males..	17	1,159	....
“ “ “ Females 24	....	253	1,619
“ Conventual.....	6	253	....
Instituto Nacional, Univ. Dept. 1	211	....	....
“ “ Preparatory. 1	669	....	....
Special Schools.....	6	595	....
National Schools for Males ...	238	12,029	....
“ “ “ Females.. 65	....	....	2,828
Municipal Schools for Males ..	66	3,678	....
“ “ “ Females.. 30	....	....	1,469
Private Schools &c., for Males... 194	5,879	....	....
“ “ “ Females.. 105	....	....	2,939
Total (1855).....	768	26,453	8,855

NATIONAL FORCES.

1.—*Army of the Republic.*

Artillery.....	1	Regiment.....	505	men.
Infantry.....	4	Battalions.....	1,600	"
Cavalry.....	1	Regt. Grenadiers.....	256	"
	1	Dragoons.....	296	"
Military School—Cadets, &c.....		Squadron Lancers.....	145	"
Officers.....			80	"
			344	"
Total strength.....			3,246	"

2.—National Guard (31st December, 1855.)

Provinces.	Artillery.	Infantry.	Cavalry.	Total.
Atacama.....	...	1,959	866	2,815
Coquimbo.....	...	1,068	2,069	3,137
Aconcagua.....	...	1,524	3,101	4,625
Valparaiso.....	315	2,517	2,162	4,994
Santiago.....	...	6,554	4,254	10,828
Colchagua.....	...	1,235	877	2,112
Talca.....	...	746	1,722	2,468
Maule.....	236	1,004	1,761	3,001
Nuble.....	...	996	1,784	2,782
Arauco.....	...	1,091	2,042	3,133
Concepcion.....	171	955	637	1,763
Valdivia.....	65	884	1,648	2,597
Chiloe.....	293	9,222	912	10,427
Total.....	1,060	29,757	23,845	54,662

3.—*Navy of the Republic* (1855.)

Corvette "Constitution"	18 guns.
Brigantine "Ancud"	14 "
" " "Meteora"	10 "
Hermaphrodite "Janequeo"	4 "
Barque "Infatigable"	4 "
Steamer "Casador"	3 "
Frigate "Chile," 1,767 tons	—
Steamer "Esmeralda," 850 tons, 200 horse power.	

PUBLIC FINANCE.

1.—Revenue Account

Receipts.		Expenditure.	
1851	\$4,427,906	1851.....	\$4,712,147
1852.....	5,480,480	1852.....	4,937,384
1853.....	5,552,484	1853.....	5,511,918
1854.....	5,946,216	1854.....	5,924,306
1855.....	6,287,526	1855.....	5,484,686

2.—Public Debt (1855-6).

Debt Jan. 1, 1855.	Redeemed.	Jan. 1, 1856 Debt
6,833 bonds at 6 per cent....£683,300	£29,300	£654,000
6,574 bonds at 3 per cent... 657,400	15,300	642,100
Total foreign.£1,340,700	£44,600	£1,296,100
Or, \$6,703,500	\$223,000	\$6,480,500
Consolidated Interim Debt, 3 per cent, re- cognized 30th July, '56		1,475,675
Sequestrations recognized at 3 per cent....		484,725

Total foreign and domestic \$8,440,900

COMMERCE OF CHILI.

1.—General Statement.

Exports of domestic products.	\$13,278,416	\$16,108,398
" of foreign products..	1,348,740	1,568,513
Total exports.....	\$14,627,156	\$17,676,911
Imports from for'n countries.	17,428,299	18,443,287
Total commerce.....	\$32,055,453	\$36,120,198

2.—Value of Principal Exports.

	1854.	1855:
Flour.....	\$1,885,577	\$3,229,794
Grain.....	405,580	1,078,113
Copper in bars.....	2,772,366	2,909,916
Native Copper.....	662,269	1,729,973
Ores of Copper.....	881,893	1,322,365
Ores of Silver.....	1,428,462	1,603,889
Silver and Copper Ores	5,963	93,560
Vegetables, beans, &c.	89,984	115,326

3.—Quantities of Minerals Exported.

	1854.	1855.
Copper in bars, quintals..	171,989	177,765
Native Copper, " ..	144,216	257,852
Ores of Copper, " ..	445,042	559,560
Silver and Copper Ores ..	1,974	9,873
Ores of Silver, " ..	157,617	255,799
Ores of Cobalt, " ..	..	4,348
Silver in bars, &c., marcos	301,577	270,984

4. *Importation of Sugar, Coffee, Tea and Iron.*

	Sugar, arrobas.	Coffee, quintals.	Tea, pounds.	Iron, quintals.
1844....	245,217	1,939	26,713	38,600
1845....	330,307	1,722	31,552	52,963
1846....	607,427	1,941	25,227	18,991
1847....	511,837	921	33,728	14,968
1848....	413,956	2,064	49,568	32,989
1849....	227,097	1,447	53,032	43,956
1850....	508,281	2,737	36,513	58,969
1851....	850,729	1,670	80,447	38,842
1852....	730,757	4,188	104,207	115,835
1853....	711,635	3,069	65,895	14,175
1854....	731,427	2,954	89,960	52,859
1855....	1,513,815	4,518	112,264	155,740

5. *Annual Movement of Commerce.*

Years.	Exports.	Imports.	Total.
1844....	\$4,881,561	\$8,596,674	\$13,478,235
1845....	5,623,181	9,104,764	14,727,945
1846....	6,340,384	10,149,136	16,489,520
1847....	7,021,334	10,068,849	17,090,183
1848....	7,234,469	8,601,557	15,836,026
1849....	9,424,220	10,722,719	20,146,939
1850....	11,392,452	11,788,195	23,180,647
1851....	9,666,354	15,894,972	25,561,326
1852....	12,216,486	15,347,332	27,563,818
1853....	11,230,844	11,553,696	22,784,539
1854....	14,627,156	17,428,299	32,055,453
1855....	17,676,911	18,433,287	36,110,198

6. *Commerce of Chile with the United States.*

(From U. S. Commerce and Navigation Tables.)

	Value of Exports			Value of Imports	
	Domestic.	Foreign.	Total.	Imports.	
1849..	\$1,722,457	\$294,643	\$2,017,100	\$1,817,723	
1850..	1,297,133	125,588	1,422,721	1,796,877	
1851..	1,608,577	286,428	1,895,005	2,734,746	
1852..	2,043,836	295,297	2,339,133	2,062,160	
1853..	2,157,320	169,117	2,326,437	2,214,252	
1854..	1,942,330	250,929	2,193,259	3,332,167	
1855..	2,994,231	432,026	3,426,257	3,518,896	
1856..	2,591,354	276,389	2,867,743	2,467,819	
1857..	2,473,228	433,957	2,907,185	3,742,439	
1858..	1,680,187	292,354	1,972,541	2,655,263	

7. *Mercantile Marine.*

	Vessels.	Tons.	Men.
1855-6.....	265	62,005	2,824
1847-8.....	105	12,628	....
Increase	160	49,377	....

WEIGHTS, MEASURES, AND MONEYS.

Old System.—Those of Spain. See Ecuador.*New System.*—Those of France. The dollar=5 francs. The condor=\$10. Sub-divisions in proportion.

MEXICO.

There are in this country 85 cities and towns, 193 large villages, 4,709 villages, 119 communities and missions, 175 hacienda or estates, and 6,092 farms. The population in 1850 was, according to official statements, 7,661,919; in 1854, 7,853,395, and in 1858, 7,859,564.

CENSUS OF OREGON, 1858.

Counties.	Populat'n.	Taxable Property.	Capitals.
Benton.....	2,497	\$1,390,610	Corvallis.
Clackamas.....	3,333	1,352,430	Oregon City.
Clatsop.....	416	216,377	Lexington.
Columbia.....	400	211,016	St. Helens.
Coos.....	223	65,851	Port Orford.
Curry.....	891	120,209	.....
Douglas.....	2,105	954,793	Winchester.
Jackson.....	1,500	955,189	Jacksonville.
Josephine.....	1,100	113,767	.....
Lane.....	4,396	1,548,644	Eugene City.
Linn.....	6,009	2,142,710	Ta-ke-nah.
Marion.....	7,413	2,299,709	Salem.
Multnomah.....	3,092	2,043,581	.....
Polk.....	3,242	2,007,808	Dallas.
Tillamook.....	100	25,900	.....
Umpqua.....	968	441,106	Elkton.
Wasco.....	600	221,680	.....
Washington.....	2,271	845,010	Hillsboro'.
Yam Hill.....	2,823	1,506,880	Lafayette.
Total.....	42,862	\$18,463,372	
Total, 1853-33,324		4,578,033	
Increase in 5 yrs	9,538	\$13,885,339	

CENSUS OF LOUISIANA, 1858.

A Census of the State of Louisiana, taken last year, and lately published, gives an aggregate of 629,876. This compares with those of 1850 and 1854, as follows:

ABSOLUTE POPULATION.				
Years.	Whites.	Free Col.	Slaves.	Total.
1850.....	255,491	17,462	244,809	517,762
1854.....	301,102	23,272	263,815	588,189
1858.....	311,217	18,085	300,574	629,876

PROPORTION OF CLASSES.				
	49.34	3.37	47.28	100
1850.....	49.34	3.37	47.28	100
1854.....	51.19	3.96	44.85	100
1858.....	49.41	2.87	47.72	100

ABSOLUTE MOVEMENT.				
1850-54..	+45,611	+ 5,810	+ 19,006	+ 60,427
1854-58..	+10,115	+ 5,187	+ 36,759	+ 41,687

RELATIVE MOVEMENT.				
1850-54..	+17.81	+ 33.27	+ 7.77	+ 11.66
1854-58..	+ 3.35	+ 22.29	+ 13.93	+ 7.09

The population of New Orleans by the Census of 1858 is stated at 117,525; but this amount is said to be 40 or 50 per cent below its true value, the census having been taken during the season when a large portion of the inhabitants desert the city on account of the yellow fever.

GRANADAN CONFEDERATION.

This Federal State, formerly the Republic of New Granada, is composed of the following States:—Panama, population, 1858, 138,308;

Bolivar, 182,157; Magdalena, 73,093: Santander, 378,376; Antioquia, 224,442; Boyaca, 379,682; Cundinamarca, 517,648: Cauca, 330,331. Total population, 2,243,837.

QUERY—"HELL GATE?"

What is the true name of the passage in Long Island Sound, commonly called "*Hell Gate?*" I see it sometimes written *Hurl Gate*, and should be glad to know what is its proper name.—*Correspondent*.

Its proper name is *Hell Gate*, as we learn from the "*Novus Orbis*" of John de Laet, published at Antwerp by the Elzivirs in 1633. In the eighth chapter of his third book, devoted to a particular description of New Belgium, he thus writes:—"In interiorum hunc sinum, majoris fluvii ramus, aut ut alii volunt, alius amnis exit, quem nostri, inferni os, vulgo, *Helle Gat*, appellant, &c., &c."

"In this inner bay, a branch of a greater river, or as some will have it, another river makes out, which our people call *inferni os*; in common speech, *Hell Gate*."

The latin version of de Laet, *inferni os*, leaves no doubt that the original name bestowed by the Dutch was, the Gate of Hell, *Helle Gat*; or, as we say, *Hell Gate*.

DEPARTMENT OF PUBLICATIONS.

BOOKS, MAPS AND CHARTS, ETC., *Purchased or donated since last Report.*

Acknowledgements of all donations to the Library will be made in the first number of the JOURNAL, issued after they have been received and entered.

The friends of the Society, and all desirous of facilitating the study of Geography and Statistics, are respectfully urged to send to the Library Rooms (Clinton Hall, Astor Place,) donations of books, atlases, maps and charts, whether ancient or modern, connected with these pursuits.

It is also important that the Society should possess a complete collection of all existing textbooks in Geography, and its cognate sciences; and the publishers of such works are requested

to send copies thereof, so as to create a department of the Library for the special use and reference of teachers and others interested in educational matters.

NEW YORK—(*Presented by the Regents of the University.*)

- Documents of the Assembly of the State of New York, 81st session, 1858. Albany, 1858. 6 vols., 8vo.
- Journal of the Assembly of the State of New York, at their 81st session, begun and held at the Capitol, in the City of Albany, on the 5th day of January, 1858. Albany, 1858. 1 vol., 8vo.
- Documents of the Senate of the State of New York, 81st session, 1858. Albany, 1858. 3 vols., 8vo.
- Journal of the Senate of the State of New York, at their 81st session, &c., 1858. Albany. 1 vol., 8vo.
- Catalogue of the Books on Bibliography, Typography and Engraving, in the New York State Library. Albany 1858. 1 vol., 8vo.
- Seventy-first Annual Report of the Regents of the University of the State of New York. Albany, 1858. 1 vol., 8vo.
- Eleventh Annual Report of the Regents of the University of the State of New York, on the condition of the Cabinet of Natural History. Albany, 1858. 1 vol., 8vo.
- Annual Report of the Trustees of the New York State Library. Albany, 1858. 1 vol., 8vo.

NEW BRUNSWICK AND NOVA SCOTIA—(*Presented by the Author.*)

- New Brunswick, with Notes for Emigrants, comprehending the early history, an account of the Indians, settlement, topography, statistics, commerce, timber, manufactures, agriculture, fisheries, &c. By Abraham Gesner, Esq., Surgeon. London, 1847. 1 vol., 8vo., pp. 388.
- First Report on the Geological Survey of the Province of New Brunswick. By Abraham Gesner, Esq., Surgeon, &c. St. John, N. B., 1839. 1 vol., 8vo.
- The Industrial Resources of Nova Scotia. By Abraham Gesner, Esq., Surgeon, &c. Halifax, N. S., 1849. 1 vol., 8vo., pp. 341; with Appendix, pp. 16; and Index, pp. 4; with a map.

CANADA—(*Presented by Richard S. Fisher, M. D., Secretary of the Council*)

- Trade and Navigation of Canada for the years 1852 and 1853. Quebec, 1853 and 1854. 2 vols., 8vo.

- SMITHSONIAN INSTITUTION—(*Presented by the Regents.*)
 —Annual Report of the Board of Regents of the Smithsonian Institution for the year 1857. Washington, 1858. 1 vol., 8vo.
- UNITED STATES—(*Presented by Rich'd S. Fisher, M. D., Secretary of the Council.*)
 —A complete Descriptive and Statistical Gazetteer of the United States of America, with an Abstract of the Census and Statistics for 1840. By Daniel Haskel, A. M., and J. Calvin Smith. New York, 1852. 1 vol., 8vo., pp. 754.
- ROYAL GEOGRAPHICAL SOCIETY—(*Presented by Sir R. I. Murchison.*)
 —Address at the Anniversary Meeting of the Royal Geographical Society, 24th May, 1858. 1 vol., 8vo.
 —Proceedings of the Royal Geographical Society of London, for June and July, 1858. 2 pamphlets, 8vo.
 —Journal of the Royal Geographical Society of London, from 1840 to 1857, with Index. London: 17 vols., 8vo.
- WIND AND CURRENT CHARTS—(*Presented by the Author.*)
 —Explanations and Sailing Directions to the Wind and Current Charts. By M. F. Maury, Lieut. U. S. Navy. Philadelphia. 1 vol., 4to., with 67 charts.
- UNITED STATES MAP—(*Presented by the Publishers.*)
 —Johnson's New Illustrated and Embellished County Map of the Republics of North America, with the adjacent Islands and Counties. Compiled, Drawn and Engraved by D. Griffing Johnson; and published by Johnson and Browning. New York and Washington, 1858. Mounted, 7 ft. by 6 ft.
- NIPHON—(*Presented by Lieut. John K. Duer, U. S. Navy.*)
 —Japanese Map of the Island of Nippon.
- AMERICAN ATLAS—(*Presented by A. Goldsmith, Esq.*)
 —The American Atlas, or a Geographical Description of the whole Continent of America. By Thomas Jeffreys. London, 1778. 1 vol., folio.
- PARANA AND URUGUAY RIVERS—(*Presented by the Navy Department.*)
 —The Track Survey of the River Parana. By Com. T. J. Page, U. S. Navy, 1855. Washington. Sheets Nos. 2, 3, 4, 5, 6, 7, 8 and 9.
 —The Track Survey of the River Uruguay. By Com. Thos. J. Page, U. S. Navy, 1855. Washington. Sheets Nos. 1 and 2.
- NEW YORK CITY DIRECTORY—(*Presented by the Publisher.*)
 —Trow's New York City Directory for 1857-8. New-York, 1857. 1 vol., 8vo., pp. 950. (17 copies.)
- CONGRESSIONAL PUBLICATIONS—(*Presented by Hon. John Kelly, M. C.*)
 —Commercial Relations of the United States with all other Foreign Nations. By Edmund Flagg. Washington, 1856-7. 4 vols., 4to.
 —Explorations of a Railroad Route from the Mississippi River to the Pacific Ocean. Washington, 1856, '57 and '58. Vols. 3, 4, 5, 6, 7 and 8. 4to.
 —Congressional Globe and Appendix for the 34th Congress, 1855, '56 and '57. Washington. 4 vols., 4to.
- PHYSICAL GEOGRAPHY—(*Presented by Mrs. Somerville, Florence, Italy.*)
 —Physical Geography of the Earth. By Mary Somerville. London, (4th edition) 1858. 1 vol., 8vo.
- RAILWAY BRIDGE—(*Presented by the Author.*)
 —Report on a Survey for the Railway Bridge over the St. Lawrence at Montreal. By Thos. C. Keefer, C. E. Montreal, 1853. 1 vol., 8vo., with a map.
- ROYAL SOCIETY—(*Presented by Sir J. West.*)
 —Proceedings of the Royal Society of England, 1857 and 1858: London: 3 Nos., 8vo.
 —List of Members of the Royal Society, up to to 30th November, 1857. London: 8vo.
 —Report of the Copley, Rumford and Royal Medals, compiled by James Hudson. London: 1834. 1 vol., 4to.
 —Sir Humphrey Davy's Six Discourses before the Royal Society of England. London: 1827. 1 vol., 4to.
- AGRICULTURE—(*Presented by Ben: Perley Poore, Esq.*)
 —Journal of the United States Agricultural Society for 1853-4-5-6-7. Boston: 5 vols., 8vo.
 —Mathew Carey's Address before the Philadelphia Society for Promoting Agriculture, 20th July, 1824. 1 pamph., 8vo.
 —Robert Vaux's Address before the Philadelphia Society for Promoting Agriculture. Philadelphia: 1825. 1 pamph., 8vo.
- POSTAL AFFAIRS—(*Presented by Hon. Horatio King.*)
 —List of Post Offices in the United States. By D. D. T. Leech. Washington: 1857. 1 vol., 8vo.
 —Reports of the Postmaster General for 1853-4-5-6-7. Washington: 1853-8. 5 vols., 8vo.

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No. 3.

PROCEEDINGS.

FIFTH MEETING (for the season,) February 10, 1859.

The Society met this evening by invitation of the Council, for the inauguration of its new Rooms in Clinton Hall, (adjoining the Reading-rooms of the Mercantile Library Association,) consisting of a room for the Library, and a larger hall for public meetings.

The President, on taking the Chair, remarked on the informal character of the meeting, but said he could not allow the occasion to pass without congratulating the Society on its present prosperous condition, which, to those who, with him, had watched it from its earlier stages of development, was eminently satisfactory. He urged upon the gentlemen present the propriety of aiding the Society to establish a Statistical Library, which was so much needed in this city, and for which the Council were making strong efforts. The convenient location of the Rooms, the accessibility of the Library to every one wishing to consult it, and the increased zeal which seemed to animate the management of the Society, gave the fullest assurance of future prosperity.

Archibald Russell, Esq., second Vice-President of the Society, read a paper on the "*Origin and Progress of Societies Devoted to Geography and Statistics.*"

Rev. Joseph P. Thompson, D. D., third Vice-President, excused himself from offering more

than his congratulations to the Society on the evident tokens of its prosperity.

Rev. Joshua Leavitt, D. D., one of the most active early members of the Society, spoke of the value and importance of statistical science, and the necessity that existed in this country, of more accurate information on topics of passing interest. He also alluded to the usefulness of the enterprise, and the renewed exertions now making toward placing the Society on a permanent basis.

Hon. C. P. Daly addressed the meeting on the present condition and prospects of the Society, and on the necessity for laying the foundation of a Library which should command the attention and respect of the scholar, the merchant and the statist.

The President then invited the members and guests to the refreshment room, where they partook of a collation; after which the Society informally adjourned.

SIXTH MEETING, March 3, 1859. The President in the Chair.

After reading and approving the minutes of the last meeting, it was moved and carried that, on account of the inclemency of the weather, the delivery of the Annual Address, by the Rev. Joseph P. Thompson, D. D., be postponed to Thursday, the 17th.

Without transacting any further business, the Society adjourned.

DEPARTMENT OF GEOGRAPHY.

ARIZONA AND SONORA.*

The word Arizona is undoubtedly derived from the Aztec. In the original it is Arizuma, and the change is a corruption into the present word, which is accepted as Spanish. We have no decided information as to its meaning, but the impression among those who have been curious enough to investigate, is that it signifies "silver-bearing." This impression gains strength from the fact that the Arizona mountains are very rich in silver, and that a tradition of a silver mine, called La Arizona, of incredible richness, still exists among the Mexican people near the frontier of our newly-acquired territory.

The proposed Territory of Arizona is bounded on the north by the parallel of latitude 33° 40'; on the east by Texas; on the south by Texas and the Mexican States of Chihuahua and Sonora; and on the west by the Colorado river, which separates it from California. This great region is about 700 miles long, with an average width of about 140 miles, and contains nearly 100,000 square miles.

It embraces within its borders three of the largest rivers on the continent west of the Mississippi, viz: the Rio Grande, the Gila, and the Colorado of the West. The Colorado is the only navigable stream, and by its waters and those of the Gulf of California, Arizona is placed in easy communication with San Francisco and the Pacific coast. The natural outlet for the productions of Arizona must be through a port on the Gulf of California, and the acquisition of Arizona necessitates the possession of Sonora.

That portion of Arizona now occupied, and to which public attention is attracted in so remarkable a degree, has been better known heretofore as the Gadsden Purchase. It was acquired by purchase from Mexico, during the

mission of General Gadsden, at a cost of ten millions of dollars. In the original treaty, as negotiated by General Gadsden, a more southern boundary than the one adopted by the Senate of the United States in confirming the treaty, was conceded by Santa Anna. The line at present is irregular in its course, and cuts off from our territory the head of the Santa Cruz river and valley, the Sonoita valley, the San Bernardino valley, the whole course of the Colorado river from a point twenty miles below the mouth of the Gila river, and, worse than all, the control of the head of the Gulf of California, and the rich and extensive valley of Lake Guzman, besides a large and extremely valuable silver region, well known both to Mexicans and Americans—the Planchas de la Plata. General Gadsden's line included nearly all the territory south of the Gila river to the 31st parallel of latitude—all the advantages above mentioned—and gave us the mouth of the Colorado river.

The Gadsden purchase is attached, by act of Congress, to the territory of New Mexico. At the time of its acquisition there was scarcely any population, except a few scattering Mexicans in the Mesilla valley, and at the old town of Tucson, in the centre of the territory. The Apache Indian, superior in strength to the Mexican, had gradually extirpated every trace of civilization, and roamed uninterrupted and unmolested, sole possessor of what was once a thriving and populous Spanish province.

In the possession of the writer of these notes is a map drawn in 1757, over one hundred years ago, presented by the Society of Jesuits to the King of Spain. The original of this map is now in the archives of the Mexican Government. It was copied, with the notes relating to the territory, and to Sonora, Chihuahua and Sinaloa, by Captain C. P. Stone, late of the United States Army. The map bears the inscription: "*Carte levee par la Societe des Jesuites, dediee au Roi d'Espagne en 1757.*"

The copy of the map, and the accompanying notes, are certified as accurate by the officer of the Mexican Government in charge of the archives.

My information, therefore, upon the early history of this comparatively unknown domain, is accurate and reliable. As early as 1687, a Jesuit missionary from the province of Sonora, which, in its southern portion, bore already the impress of Spanish civilization, descended the valley of Santa Cruz river to the Gila. Passing down the Gila to its mouth, after exploring the country, he retraced his steps, penetrated the

* The Geography and Resources of Arizona and Sonora. An Address before the American Geographical and Statistical Society, by the Hon. Sylvester Mowry, 3rd February, 1859.

country north of the Gila river for some distance, and ascended the Salinas or Salt river, and other northern branches of the Gila. The explorations of this energetic priest did not stop here. Proceeding east, he explored the valley of the San Pedro and its branches; thence along the Gila to the Mimbres, and probably to the Rio Grande and the Mesilla valley. Filled with the enthusiasm of his sect, he procured authority from the head of the order in Mexico, and established missions and settlements at every available point.

The reports of the immense mineral wealth of the new country, made by the Jesuits, induced a rapid settlement. There are laid down on the map before me more than forty towns and villages. Many of these were of considerable size. There were a few north of the Gila, and several on the lower Gila, near the Colorado. The Santa Cruz and its tributary valleys teemed with an agricultural and mining population. Thousands of enterprising Spaniards cultivated the rich valley of the San Pedro, and scattered settlements flourished at every suitable stream and spring at the foot of the mountains towards the Rio Grande.

In the western part of the territory were the missions of St. Pierre, St. Paul, St. Matthias, St. Simond, St. Francisco, Merci, the ranches of Eau Cheri, Eau de la Lune, and others; on the Santa Cruz the missions of San Xavier del Bac, Santiago, San Cayetano and San Philippe, the towns of Tucson, Tubac, Regis, San Agusta, and many others. San Xavier del Bac is still in existence. It is a mission church of great size and beauty, magnificently ornamented within; \$40,000 in solid silver served to adorn the altar. Upon the San Pedro river, where the missions of St. Marco, San Salvador, San Pantaleon, Santa Cruz, and the towns of Quiduria, Rosario, Eugenia, Victoria and San Fernando—the latter at the mouth—with many more. To the east some small settlements were found on the Valle del Sauz, on the Mimbres, at the copper mines north of the Mimbres, and to the south the immense grazing and stock-raising establishment of San Bernardino, where since have been raised hundreds of thousands of cattle and horses. The Indians in the vicinity of the missions were reduced first to obedience by the Jesuits, and then to slavery by the Spaniards.

The notes referred to above contain the names and localities of more than a hundred silver and gold mines, which were worked with great success by the Spaniards. The survey of the Jesuit priest, about 1687, was repeated in 1710, with renewed discoveries, and consequent accession

of population. From this time up to 1757 the conquest and settlement of the country was prosecuted with vigor, both by the Jesuits' Society and Spanish Government.

The missions and settlements were repeatedly destroyed by the Apaches, and the priests and settlers massacred or driven off. As often were they re-established. The Indians at length, thoroughly aroused by the cruelties of the Spaniards, by whom they were deprived of their liberty, forced to labor in the silver mines with inadequate food, and barbarously treated, finally rose, joined with tribes who had never been subdued, and gradually drove out or massacred their oppressors. A superior civilization disappeared before their devastating career, and to-day there is scarcely a trace of it left, except wide-spread ruins, evidences, everywhere, of extensive and hastily deserted mining operations, and the tradition of the country. The mission of San Xavier del Bac, and the old towns of Tucson and Tubac, are the most prominent of these remains.

From 1757 down to 1820, the Spaniards and Mexicans continued to work many valuable mines near Barbacora, and the notes in my possession speak of many silver mines, most of which contained a per centage of gold. "The San Pedro gold mine, in 1748, was worked with extraordinary success." Among the mines anciently worked, as laid down in the authorities heretofore referred to, were the Dolores, San Antonio, Casa Gordo, Cabriza, San Juan Baptista, Santa Anna, (which was worked to the depth of 120 yards,) Rosario, Cata de Agua, Guadalupe, Connilla, Prieta, Santa Catarina, Guzopa, Hurstano, Arpa, Desculidara, Nasco-sare, Arguage, Churinababi, Huacal, Pinal, and a great number of others, which it would only be tedious to mention.

Every exploration within the past few years has confirmed the statements of the ancient records. The testimony of living Mexicans, and the tradition of the country, all tend to the same end. Colonel A. B. Grey, Colonel Emory, Lieutenant Michler, Lieutenant Parke, the Hon. John R. Bartlett, late of the United States Boundary Commission, all agree in the statement that the territory has immense resources in silver and copper.

The Hon. John R. Bartlett says of the "Salinas," one of the northern branches of the Gila, that it alone will supply food for a great state. It must be recollected, in this connection, that the great mineral wealth of Arizona will call for and amply repay for the redemption and expensive cultivation of all the available lands, and that irrigation produces immensely great-

er crops than the other method of planting. Throughout the whole of Utah, irrigation has been resorted to with the greatest success. The soil in Utah, in no place that the writer saw it, could in any way be compared to that of the bottom lands of Arizona.

Captain Whipple, in his valuable report of exploration for the Pacific railroad, published by order of Congress, describes crossing the upper part of this region, and which is watered by the Rio Verde and Salinas. He fully sustains me in my remarks on those rich valleys.

The notes above referred to, in the possession of the writer, speak of great farming and grazing establishments scattered over the whole face of the territory, between 1610 and 1800, which produced abundant crops of cereals, fruits and grapes. These statements are confirmed by the testimony of Major Emory and his report, where he enumerates several of the most extensive—by Gray, Bartlett, Parke, and Colonel Bonneville. Many of the ranches, deserted by the Mexicans on account of the Apache Indians, have upon them large, well-built adobe houses, which must have cost the builders thousands of dollars. Many of these have been occupied under squatter titles by emigrants within the last few years. Of others, only the ruins remain, having been destroyed by the depredations of the Indians, or by the heavy rains of succeeding years.

The country east of the Rio Grande is a great plain, broken only by the Sacramento and Gaudalupe mountains. Except in the towns on the river, there is no population. The Mescalero Apaches have, until lately, made settlement unsafe. The establishment of Fort Stanton, and the activity of the United States troops, have, however, reduced this once formidable tribe in number and spirit, so that an early settlement of the fine country in the vicinity of the Sacramento mountains may be expected. A number of bold, clear streams, alive with trout and other fish; a good proportion of arable land, and an inexhaustible supply of oak, pine, hackberry, and other timber, are here found. In the Organ mountains, opposite the Mesilla valley, there are silver mines of great value. One of these, the old Stevenson mine—now known as the Fort Fillmore mine—has been purchased by New York capitalists, and preparations are making to develop its undoubted wealth.

The Rio Grande valley, including the well known Mesilla, contains a large extent of unoccupied arable land, with plenty of water for irrigation. Lately the protection afforded by United States troops has enabled the people to cultivate in safety; and during the last year

nearly 100,000 bushels of grain were raised in the valley, besides a large number of cattle and horses. It is worthy of remark, that the settlements here, although mostly Mexican, have been made since the United States acquired the territory, and that the lands are held under American title. The population is quiet, well behaved, and thoroughly American in feeling. It is estimated, and I believe correctly, that at least 50,000 people can be settled on the Rio Grande within the Arizona boundaries, and there are many attractions for the farmer and stock-raiser.

West of the Rio Grande the country is a succession of *mesas* or table lands, ascending gently for nearly ninety miles to the Sierra Madre, and thence westward for five hundred miles, gradually descending until they reach the Gulf of California. This extensive plateau, south of the Gila, is broken by two well defined ranges of mountains, the Chir-aca-hui and Santa Rita, and by a number of isolated peaks, which assume something the form of a sugar-loaf, and are called by the Mexicans Picahos and Peloncillos.

The sun never shone on a finer grazing country than upon the three hundred miles west of the Rio Grande. The traveler has before him throughout this entire distance a sea of grass, whose nutritious qualities have no equal; and the stock-raiser in January sees his cattle in better condition than our Eastern farmer his stall-fed ox.

Ninety miles west of the Rio Grande is the Mimbres river and valley. Passing over the dividing ridge of the Sierra Madre, with so gentle an ascent and descent as to make it almost imperceptible, you descend into a wide and beautiful valley, which, at no distant day, will support a large population. The banks of the river are covered with a fine growth of cottonwood; and above the usual crossing for emigrants, wild grapes and berries are found in great profusion. The Santa Rita del Cobre copper mine, of ancient fame, and a little to the north-west of the Mimbres, has lately been reopened by a capitalist, who has already begun to reap the reward of his enterprise. It is claimed that the superior malleability and ductility of this copper must make the demand for it very great. The Mimbres river sinks before reaching the line of Mexico. Some statements, which I have never been able to authenticate, make it flow, in very rainy seasons, into Lake Guzman.

The Suance or Valle de Sauz is the next valley on the line of the emigrant road. The waters of this stream are very limited and inter-

mittent. As it approaches the Gila the valley becomes better, but it will never be available for extensive agriculture.

The San Pedro river and valley, 250 miles west of the Rio Grande, is, *par excellence*, the agricultural district south of the Gila. The valley is wide, very rich, and considerably over 100 miles in length. There is, near the junction of the San Pedro with the Gila, and at the mouth of the Arivypa, a most beautiful and fertile region. A fine growth of ash covers the valley. The Santa Rita mountains, which separate the San Pedro and Santa Cruz, contain inexhaustible supplies of pine and oak, besides untold millions of the precious metals. A military post of four companies at the mouth of the Arivypa would open this entire country to settlement.

Still following the emigrant and mail road fifty miles, we come to the old Mexican town of Tucson and the valley of the Santa Cruz. Like most of the streams, the Santa Cruz is intermittent, sinking and rising at irregular intervals. A portion of this valley is covered with a heavy growth of cottonwood. The mountains in the vicinity contain pine and oak, and the extensive tracts of grazing lands, south to the Mexican line, are covered thickly with the mesquit—the best fuel in the world. The town of Tucson now contains about a thousand inhabitants. It once had three thousand, but the Indians, who desolated the whole of the territory, had driven away all but about two hundred at the time of the Gadsden purchase. Nine miles from Tucson, as you go up the valley of the Santa Cruz, is the old mission church of San Xavier, to which I have alluded elsewhere. It is still surrounded by a Papago Indian village, a few tame Apaches, and a few whites also live under the shadow of its towers. Incredible as the statement may seem, the church of San Xavier, with its elaborate facade, its dome and spires, would to-day be an ornament to the architecture of this great metropolis. No better evidence is needed of the resources and former prosperity of Arizona than is to be found in the now deserted missions of San Xavier and Tumacacori.

The town of Tubac, fifty miles south-east of Tucson, which now boasts a population of several hundred, was entirely deserted up to 1855, when it was re-occupied in part by the Sonora Exploring and Mining Company. They claim the town, and have given permission to a number of emigrants to occupy the old houses, and build new ones. Over what was once the towers of the barracks of the Mexican troops, now floats a banner bearing the arms of peace, a

hammer and pick, the insignia of the company; and in the rooms beneath, which once echoed to the tread of the successful Apache fighter, are now sold the calicoes and cotton goods of Lowell, and all manner of Yankee notions. The great Huntzelman mine, the mines of Arivaca, Sopori and Santa Rita, are within a circle of twenty miles from Tubac.

Three miles from Tubac is the mission of Tumacacori. Its venerable walls now shelter political exiles from Sonora, and a few enterprising Germans; and its rich lands are cultivated by the American squatter. Twelve miles farther up the Santa Cruz is the Rancho of Calabazas, claimed as the property of the Gandara family, of Sonora. The extensive buildings are occupied by American families; and the blacksmith's forge is installed in a room once dedicated to more delicate uses.

The Sonoita valley, which opens into the Santa Cruz, near Calabazas, is the only one in any degree protected by the United States troops. It is about fifty miles long, in no place exceeding a mile in width, and generally much narrower. When I passed up it to Fort Buchanan, the whole valley was golden with grain. On several of the farms two crops were raised last year, wheat and corn, wheat and beans, and other vegetables. The farmer during the past year found a ready market for his produce, his purchasers being the troops and the Overland Mail Company. This valley is almost entirely occupied by an intelligent and adventurous American population.

The Santa Cruz and San Pedro approach each other near the Mexican line; and by way of Santa Cruz, a Mexican town at the head of the valley in Sonora, you can pass from one to the other with ease. The whole region between the Rio Grande and the Santa Cruz is broken with conical-shaped hills and mountains, called by the Mexicans *peloncillos*. At the foot of these hills are found springs, which afforded water to the immense herds of cattle and horses which once covered the country; and at many of these springs are found the ruins of buildings occupied by the herders. The hills are covered to the top with the gramma, and other nutritious grasses.

Twenty miles east of the Sonoita valley, and just north of the town of Santa Cruz, is one of the richest silver regions of Arizona.

The Wachupe mountain is believed to be inexhaustible in silver. The San Antonio and Patagonia mines, lately opened, promise a rich yield to their owners. One of these is of especial value, yielding, besides a large percentage of silver, 53 per cent. of lead, which is pur-

chased readily by the surrounding mining companies, to be used in reducing their ores.

The once celebrated Compadre mines, lately re-discovered, are in this vicinity. The present fortunate proprietors found them after long and painful search. The shafts were found carefully concealed, partially filled with rubbish; and thirteen furnaces in tolerable preservation, prove how extensively the mines were once worked by the Spaniards. Here, as in the whole of Arizona, the work of prospecting and exploring has but just begun. The ores of this district are principally argentiferous galena.

West of the Santa Cruz, and south of the valley of the Gila to the Colorado river, the territory is generally an irreclaimable desert. Its mountains abound in the precious metals, and a sufficiency of water for mining operations can usually be obtained without exorbitant expense. The celebrated Ajo copper mine, now known as the Arizona copper mine, is in this district.

The valley of the Gila river, whose waters, flowing from east to west, divide the territory nearly in the centre, 400 miles long, can in most places be brought under cultivation to a greater or less extent.

Since the discovery of gold, a number of farms have been opened, and hundreds of acres of rich land put under cultivation. The Gila empties into the Colorado, 25 miles above the head of the Gulf of California. It is well to observe here, that the difference in soil in different latitudes has not been sufficiently appreciated. The same soil which, under the climate of Oregon is barren and worthless, becomes, under the more genial sun of Arizona, fruitful, and, when irrigated, produces the same extraordinary crops as California.

The land cultivated by the Pimos on the Gila seems inexhaustible. Year after year they cultivate the same crops on the same land with nothing but water to enrich it, and there is no sign of failure.

The valley known as La Florida, near the mountain of the same name, in longitude 109°, is worthy of especial mention, as having at its head the ruins of a once flourishing town. A large population will again occupy it at no distant day. But little is known of the country north of the Gila. It is very mountainous, but contains several valleys of considerable size, nearly all of which bear the impress of an ancient and superior civilization. The principal northern tributaries of the Gila are: the Salado, the Tuberoso, the San Carlos, and the San Francisco, (sometimes called the Alamos.) The Salado, according to my informant, *Marcial*, an

Apache Chief, has six small branches—four flowing from the east, two from the west. The Salado is the largest of all these streams, and has its source about latitude 34° in the Sierra Blanca.

On all of these streams the Apache Indian cultivates crops, principally of corn. The band known as the Coyetero, Pinal, or Sierra Blanca, cultivate most, although they have had the least intercourse with the whites.

The Indians of Arizona are best classed as friendly and hostile. The friendly Indians are the Pimos, Maricopas, Papagos and Yumas, with a few scattering miserable tame Apaches. The Pimos and Maricopas occupy a beautiful and fertile tract on the Gila, 180 miles from its junction with the Colorado. A brave and hospitable race, they live in villages, and cultivate the arts of peace. Their regular fields, well-made irrigating ditches, and beautiful crops of cotton, wheat, corn, pumpkins, melons and beans, have not only gladdened the eye, but also given timely assistance to the emigrants who have traversed Arizona on their way to the Pacific. The costume of the Pimos is extremely simple, only covering their loins, and a small straw hat, except in the case of the chiefs, who wear a sort of pantaloons of coarse cotton cloth. The Pimos and Apaches wage hereditary and fierce war, in which the Pimos are generally the victors. So high were their services valued by the Mexican government, as a barrier to the incursions of the Gila Apaches, that whenever they visited the Mexican towns, the authorities treated them with marked hospitality and kindness. The Maricopas live near the Pimos, and by contiguity and intermarriage have become similar in their customs. The Papagos resemble, but are inferior to the Pimos; do not cultivate so much, and live in scattered villages in the central and western parts of the territory.

The Apaches are classified under their modern names: the Mescaleros, east of the Rio Grande; the Mimbres, Mogollones, Chir-acahuis, Coyeteros or Pinaleros, Sierra Blancas, and the Tontos. In the order I have mentioned them, west from the Rio Grande, all of these have their homes north of the Gila, except the Chir-acahuis. Velasco says these tribes have no fixed residence, no common society, no positive antecedents; they are best compared to the prairie wolf, sneaking, cowardly, revengeful, quick to assassinate the weak, and to fly from or yield to the strong. It is impossible for one who has not seen Northern Mexico, to imagine the desolation they have made in a country where nature has done so much. The

name Infeliz Sonora—most unhappy—given by all the old writers, is most painfully true; from the Gila, in latitude $32^{\circ} 30'$, to Guaymas, in latitude 28° , their ravages are everywhere visible. Horrible as is the statement, more than one-fourth of the Apaches of to-day are Mexican captives, or their descendants. Not only ranches, and villages, and towns, but whole districts, have been depopulated, and the work is still going on. In small parties, and by different mountain passes, they descend into Sonora, surprise and attack a train of travelers or a town, massacre the men, and carry off the women, with such booty as they can hastily seize, to their haunts on the Gila.

The whole number of Apache warriors does not exceed two thousand. I have investigated this subject with probably more care than any other person, and am satisfied the number is rather under than over the truth.

The Nevajoes are included by Velasco among the Apaches. They live in New Mexico along the 34th parallel, north latitude.

The Yumas, the remains of a once powerful tribe, live on the Colorado, near the Gila; they are quiet; sufficiently agricultural to subsist. A few years will leave only their name.

The climate of Arizona, except on the Lower Gila and the Colorado, is delicious; never extremely hot, with cool summer nights, it offers great attractions to those who desire more genial skies than those of the North. Snow never lays in the winter, seldom falls; frost is rare, though the nights are often cold, seldom freezing. The season for cultivating is long, fruits blooming in February and March. Cotton, corn, wheat, barley, tobacco, melons, grapes, peaches, and all the vegetables, yield profuse crops throughout the territory. The grape of the Rio Grande valley has no superior, and wine of good quality is manufactured from it. The rainy season in Arizona is from June to September, inclusive.

Professor Henry has, I believe, demonstrated that no rain falls in Arizona or Sonora. I have not seen his paper, but understand it is a beautiful theory. It is much to be regretted, for his sake, although not for the country, that the facts are against it. Cultivation in Arizona is by irrigation. It is believed by those who are capable of judging, that, with subsoil plowing, good crops can be obtained, and the results of one year are quoted in support of the theory. It will take a series of years to prove it satisfactorily to the farmer. The yield throughout Arizona is two crops from the same land in each year.

The population of Arizona to-day exceeds

ten thousand souls, exclusive of Indians; two-thirds of it is established on the Rio Grande, in the towns of Mesilla, Las Cruces, La Mesa, Don Ana, Amoles, Santa Tomas, Santa Barbara, Pichacho, and the surrounding ranches. The American population of the territory is not far from two thousand—this is rapidly increasing, and the ensuing spring will see it vastly increased. The gold discoveries, the overland mail—which runs throughout the entire length of Arizona—the large amount of capital invested in the silver mines, together with the increasing movement westward of our people, will add largely to the already vigorous and enterprising population of the new territory.

The Gadsden purchase was not originally an integral part of New Mexico; it was acquired years after the treaty of Gaudalupe Hidalgo, and was only attached to that territory as a temporary expedient. It must also be remembered that the Gadsden purchase, with the portion of New Mexico which it is proposed to include within the limits of the territory of Arizona, is separated from New Mexico proper by natural boundaries; that it derives no benefit from the present connection; and that any opposition to the desired legislation arises from the Mexican population, which fears the influence of a large American emigration. Moreover, New Mexico contains upwards of 200,000 square miles, and its organic act provides for its partition; showing clearly that Congress anticipated, at no remote day, the settlement of the country by an American population, and its erection into several territories and states. The only effect of the present connection of Arizona with New Mexico is to crush out the voice and sentiment of the American people in the territory; and years of emigration, under present auspices, would not serve to counterbalance or equal the influence of the 60,000 Mexican residents of New Mexico. New Mexico has never encouraged American population.

As a matter of state policy, the organization of Arizona is of the first importance. Situated between New Mexico and Sonora, it is possible now to make it a thoroughly American State, which will constantly exert its influence in both directions to nationalize the other two. New Mexico is at present thoroughly Mexican in its character and vote. Sonora, if we acquire it at once, will be the same. By separating Arizona from it, and encouraging an American emigration, it will become "the leaven which shall leaven the whole lump." By allowing it to remain attached to New Mexico, or by attaching it to Sonora, when acquired, the American influence will be swallowed up in the great

preponderance of the Mexican vote. The Apache Indian is preparing Sonora for the rule of a higher civilization than the Mexican. In the past half century, the Mexican element has disappeared from what is now called Arizona, before the devastating career of the Apache. It is every day retreating further south, leaving to us, (when it is ripe for our possession,) the territory without the population.

The American population is mostly concentrated in the centre of the territory, in and near the Santa Cruz valley, and on the lower Gila, at the gold mines. The Overland Mail Company, by the establishment of their stations at intervals rarely exceeding twenty miles, have much facilitated intercourse and travel; and the emigration of this year will cluster around these stations, pouring a line of villages across the continent; in the language of the President, "a chain of American citizens which will never be broken." The establishment of the overland mail is not only one of the great triumphs of the age, but it is an element of civilization which none appreciates but the frontiersman.

The ores of copper found in Arizona and Sonora, are usually the sulphurets, principally grey. The ores of silver are auriferous galena, native silver, auriferous sulphuret of silver, black sulphuret of silver, sulphate of silver, sulphate of iron combined. The gangue is usually quartz or feldspar. I have before me many notes descriptive of various mineral localities, even to minuteness, but the limits of this address will not permit especial mention of them.

The development of the mineral wealth of Arizona has but just commenced, yet enough has been done to give a brilliant promise for the future. The Sonora Company have expended a large capital in opening and prospecting their rich possessions. The Heintzelman mine—so called after the President of the Company—bids fair to become more famous than any of the great mines of old Mexico. In a late letter it is claimed that the ores thus far smelted, yield the astonishing average of \$950 per ton. I saw this mine in September, of last year. About two hundred tons of the ore had already been extracted, and the yield from one small furnace was about one thousand ounces per week. At a cost of \$30,000 the company have brought from San Francisco, and erected, amalgamating works, from which they expect to obtain \$3,000 per day—a million a year. The Sopori mine, which has only been worked in a small way, promises also a rich yield. I have cut, with a penknife, native silver ore taken from the Sopori.

San Antonio and Patagonia have been already mentioned, as well as the Compadre mines. Many others are known to exist, and their owners are only waiting for the protection of a territorial government to commence work. Others are deterred by want of capital. Several hundred thousand dollars have been already invested in mines in Arizona, and several companies are now forming. It is my profound belief that the most colossal fortunes this country has ever known will be made from the mines of Arizona and Sonora.

The Santa Rita copper mine, near the Mimbres, has already been mentioned, as has the Arizona. On the Colorado, forty miles above the mouth of the Gila, on navigable waters, a copper mine is being efficiently worked. It promises to be inexhaustible, and, from its advantageous position, must be immensely valuable. The ore contains a per centage of gold. Silver has also been found on the Colorado, also gold quartz. On the Gila, copper is abundant. In fact, the Territory of Arizona seems inexhaustible in minerals. Iron, copper, silver, and gold are found in hundreds of localities. A plumbago mine was discovered during the past year.

Quicksilver is the only metal of which no mention has yet been made. I do not know of any in the Territory, though its existence is probable.

Of the great extent of the gold region of Arizona there can be no doubt. The late discovery of placers, or surface diggings, on the Gila, has long been anticipated. Emory, in 1849, expressed his belief in its existence. Many an emigrant, on his way to California, has found "the color." Senator Gwin informs me that he heard of gold on the Gila from emigrants at San Diego in 1849. All the frontiersmen and trappers unite in saying that coarse gold is found in the streams north of the Gila. Marcial, the Apache chief before mentioned, told me the same.

That gold, in quartz veins, exists in many parts of the Territory, we know, not only from ancient record and tradition, but from actual observation and experiment. Almost every silver and copper vein yet opened shows, by close analysis, a trace of gold. In the Sopori mine it has gone as high as three per cent. At the Santa Rita del Cobre, the Mexican miners, after their day's labor is over in the mine, work the placers in the vicinity, making sure but small wages. Tradition tells us that many years since the ores of this mine were so rich in gold as to pay transportation to the city of Mexico on mule-back. A gold placer is believed

to exist near a Papago village, south of Tucson. The evidence of rich gold placers in northern Sonora is indisputable. Work in them has nearly or quite ceased, on account of the Apaches, but the record of their past yield is enormous.

The facts in reference to the present condition of the Gila gold mines in Arizona are simply these: At a point on the Gila river, about twenty miles from its junction with the Colorado, and in a succession of sand hills, gold was discovered in September, 1858. The emigrants who were still on their way stopped, and, the news reaching California, others came in. I visited the Gold mines early in November, and found about one hundred men and several families. A town called Gila city had already been laid out, and temporary houses of brush and adobe were in the course of erection.

The country at this point is not inviting, and there are always, at any gold diggings, men who do not and will not work, and who, if they cannot make a living by gambling, or feeding upon some one else, depreciate the country. Gold digging is the hardest of all work, and very precarious in the richest mines. A man who is earning a comfortable subsistence at home should hesitate long about giving it up for gold hunting. The old discoveries of gold on the Spanish trail from Utah to California in 1850, the later ones in Kansas, at Pike's Peak, and in Arizona, together with the well-known placers of Sonora, establish conclusively the fact of the existence of gold throughout a great belt of the continent, from north to south.

The conclusions to be drawn from the facts I have thus hastily set forth are these: That while Arizona cannot be called an agricultural state, she has a sufficiency of arable land to support a large population; that as a grazing and pastoral region she has unsurpassed advantages; but her great wealth is found in her inexhaustible mineral resources. There can be no doubt that if Arizona to day did not contain a single acre of arable land, her gold and silver, her copper and iron and lead, would some day make her one of the wealthiest of the states of the Union.

Sonora, of which western Arizona once formed a part, is so closely connected in interest with Arizona that a brief mention of her resources and condition is necessary to my subject.

Sonora is bounded on the north by Arizona, on the east by the Sierra Madre range of mountains, which separates it from Sinaloa, on the south by the river Fuerte, and on the west by the Gulf of California and the Colorado river,

which separate it from lower California. Its capital is now Hermosillo, was formerly Ures, and, more anciently, Arizpe. The government of the state is at present an absolute despotism.

The state of Sonora, thus called by its earliest people of whom we have any knowledge, derives its name according to the best authorities, from *Sonot*, an Opatá Indian word, which means *Senora*, or *Madam*. The Conquistadores were treated with great hospitality by the Opatá Indians while visiting their rancherias or villages. As a mark of friendship, the Indians strove to imitate the Spanish pronunciation *Senora*, instead of using their own word *Sonot*, from which arose the corrupted word Sonora.

Sonora has been divided, by various writers, into upper and lower Sonora—into Pimeria Alta and Pimeria Baja—and still further, into the subdivisions of Arizpe Cieneguilla and Hocasitas in the north, with Hostimuri Alamos and the Pueblas of the Mayo and Yagui in the south. The state formerly included Sinaloa, from which it was separated in 1830. It is said to be a part of the plan of the present Governor, Peschiera, to again unite these states as the basis of a new confederacy.

The people of Sonora are generally docile, and, making allowance for the bad system of government and the great misery in which they are found, are obedient to the constituted authorities—in fact, this remarkable docility amounts to weakness of character, and which ambitious revolutionary chiefs have taken advantage of to forward their own views. At the present date, the whole country is devastated by the Apaches. Daily, from all parts, reports are brought in that the Indians have destroyed ranches, killed the inhabitants, and depopulated whole towns. This has been the case for many years, and, after so much suffering on this account, without a prospect in view for the better, it is not surprising that the Sonoranese has lost his energy of character. He gambles, to divert himself and pass away time, and, without hope for the future, he allows things to take their course—a thorough fatalist. Many become desperate, and take unlawful measures to better their condition. It only requires a skillful hand and good government to make the worthless Sonoranese of the present day a useful member of society. Comparatively few educated men are found in Sonora—a common education, consisting of reading and writing; and I believe that in the whole population it does not exceed five per cent., more particularly in the frontier towns. A leading trait in his character is hospitality, and "let the morrow take care of itself" is a common expression

in their mouths. He will share his last mouthful, and considers it a matter of course for the stranger to take his place at his board.

Sonora, for the most part, is mountainous, watered by several small rivers, abundant in mineral wealth; in fact, is considered to be one of the richest states of Mexico. There is a sufficiency of agricultural land to maintain a large population; but the true richness of Sonora consists in its mines of silver and gold, and the great facilities for raising stock. The mines at present are but little worked, owing to the Apaches and revolutions, but laboring under all these disadvantages she is still able to export annually several millions of dollars in silver bars and gold dust, large quantities of stock to California and the territory of Arizona; also flour to the adjoining state of Sinaloa.

The most famous mines and mining districts are those of Alamos, situated in the district of that name, of Jubiata, near Hermosillo; of San Xavier, San Marcial, St. Teresa de Jesus of Babacanora, at present worked by a French company, the richest mine discovered within the last two years; of Corral Vieja, gold, silver and lead; of La Canensa, silver, copper and lead; of La Guachuca las Planchas de Plata.

On the opposite side of the mountain of Babacanora, at the distance of about a league and a half, is found the Rial del Carmen, celebrated for its great mine of that name, and which has been worked to a great extent. It still yields a good profit to the Gambusino.* Ores are still found which yield from ten to twenty marcs to the batta. Ores—native silver, auriferous silver, gangue, quartz.

This mine was worked in the first years of the Spanish conquest of Mexico by Hernando Cortes, and in later years by a company of Spaniards, who found a chart and description of the mine in the archives of Mexico. It is remembered by the oldest inhabitant of Sinoquique that native silver, six inches wide, was cut out of the vein, and melted in the refining furnace without more treatment than a lead bath. This company, owing to the changes which took place in the Mexican territory, stopped work, carrying off with them several trains of mules loaded with silver; the mine then partly filled with water, and the Gambusinos, who have been and are the cause of the destruction of so many good mines, commenced operations, cutting out the upper pillars and supports, and in a short time the mine fell in, leaving treasure to an enormous amount buried

in the ruins; in later days shafts have been sunk on the same lode, worked, and ores rich in silver have been encountered, paying from fifteen to twenty marcs the nine cwt. In the rubbish which was thrown out of the old mine, a comfortable subsistence is gained by washing in battas—quantities of grain silver being found which, refined in the furnace, yield from twenty-five to thirty per cent. pure metal. This, and several other mines of Sonora, have been abandoned, not from the ores having failed or depreciated in value, but from the want of energy in the Mexican race. The mines in the hands of the Spaniards yielded enormous profits to the miner; they were men of indomitable enterprise, who employed capital, science, and spared no expense to succeed in their adventures; whereas the Mexican is poor, without energy, and too lazy to trust, or help himself. Formerly "Sonora the rich" was a proverb; now "Sonora the poor" is a stubborn fact—but not from the want of the elements of richness. These once developed, she will once more become Sonora the rich, and may be great.

Gold dust has been found in abundance in the placers of San Francisco la Sienga, las Llanos, Ouisabaquita, St. Perfecto; and Soni is famous for its gold mines, also Cocuspera and Baba Seco; in the district of the Pueblo of Cucurpe, gold is found in abundance; during the rainy season in Baquachi district of Arispe, it is also found in quantities which pay well. In a word, Sonora, considered in a mineral point of view, equals, if not surpasses, the richest country in the known world, and only requires capital, peace, and a liberal government.

The climate is good. The rainy season sets in in June, and lasts till the beginning of September; from this month until March, occasional showers fall. The cold is never severe; the weather being very similar to that in California in the same months. From March until June is considered the dry season. The heats are never oppressive; less so than in California. Two crops are raised from the same land in the year, and which for abundance cannot be surpassed—wheat, maize, beans, peas, &c., being the general grain that is cultivated. Sugar-cane is planted in great quantities in Hermosillo, San Miguel, Ures, Rayon, Oposura, Saguaripa, Huepaca, and the Rio Yaqui. A coarse kind of sugar is made, called panocha, which yields to the cultivator an excellent return for his labor. In all parts of the state most excellent tobacco is raised. Cotton is sown by the Indians in the Rio Yaqui.

The state is divided into nine districts, each being governed by a prefecto, who is appointed

* The Gambusino is a sort of mining filibuster, who works regardless of the future of the mine.

by the governor, and is responsible for the good order of his district. The port of Guaymas, at present is the only port of entry. It is a small, but in the business part, well-built town, containing about six thousand inhabitants. The harbor of Guaymas is the best on the Pacific coast. Four miles long, with an inner and outer bay, it will admit ships of the heaviest tonnage, and the commerce of the world could be transacted at this port. The entrance is protected by a long island, which makes it doubly secure.

The principal rivers of Sonora are the Fuerte, the Yaqui, the Mayo and the Sonora. The Yaqui enters the Gulf of California eighteen miles below Guaymas. It has a dangerous bar, but it is believed to be navigable for light draft steamers to Buena Vista, eighty miles from its mouth. The Sonora river flows through the Arispe valley, and is called the Garden of Sonora. It is almost wholly in the hands of the Apaches. The desolation of the depopulated towns and ranches is melancholy beyond description. The valleys of the Yaqui, Mayo and Fuerte, are the best sugar lands in the world.

Ures is a small city of about seven thousand inhabitants, and is situated about sixty leagues from Guaymas. Hermosillo is the largest city, containing from fourteen to fifteen thousand inhabitants. It is the centre of commerce. It is one hundred and ten miles north of Guaymas. The next in size and importance is the Rial de Alamos, situated on the frontier of Sinaloa; it contains from five to six thousand inhabitants; it is the centre of a large mining district, as its name implies—Rial meaning town or city of mines. Oposura, Saguariipa, Rayon, St. Miguel and Arispe, the ancient capital of Sonora, are large towns, with populations of from four to five thousand each. The entire population of Sonora does not exceed one hundred and thirty-five thousand, comprising Mexicans, (*hute de razou*.) Opatas, Yaquis, Mayos, Taumales and Papagos; this population, instead of increasing, is decreasing—the Apaches, revolutions, and emigrations to California and Arizona, producing this effect; and in a few years, if some change does not take place, Sonora will become depopulated.

Having had considerable practical experience on the plains, four journeys overland across the continent in the past four years, I was desirous of stating a few facts, showing the comparative merits of the different routes for a Pacific railroad. The limits of this address will not permit, and I therefore turn from the subject, with the prediction that the route known as the southern, along the 32d parallel, is the only

one that will be built in this generation. Every exploration has shown it to be, not only the most practicable, but probably the only practicable route. The advocates of this route point to the significant fact that the mail from San Antonio to San Diego has never once failed in eighteen months of operation, winter or summer. The great overland mail makes its best time on the 32d parallel, and that portion of the route denounced as the worst, from El Paso west, has proved itself the best. Thirteen hundred miles by stage in December or January in less than eight days: Is there any other route on the continent where this can be accomplished? Not on the Salt Lake route. It is wholly impracticable. Not on the Albuquerque route, else Lieutenant Beale would not go into winter quarters. On the 32d parallel no winter quarters are necessary. It is useless to attempt to evade this question of climate on so extended a route. In addition, the 32d parallel is by far the most level, and has the most water at all seasons of the year. (See Lieutenant Parke's report.) The first terminus of the Pacific railroad will be Guaymas, on the Gulf of California. From El Paso to Guaymas the distance is only about four hundred miles, at most four hundred and fifty. It will run across the Guzman valley through the Guadalupe or some more southern pass to Arispe, thence to Ures, thence to Hermosillo, thence to Guaymas. It will traverse a rich agricultural and mining country, and can connect with San Francisco and all the Pacific by steamers. A branch from Arizona down the valley of the San Ignacio would give Arizona the outlet she so much desires for her productions. It connects with the Texas road at El Paso, and, notwithstanding all the predictions to the contrary, the Texas road will be built. Should it be deemed desirable to extend at once to the Pacific, a steam ferry across the Gulf of California, and short railroad across lower California, to a roadstead on the Pacific, accomplishes the desired end. If these views were elaborated, they could be supported by an array of evidence not to be overthrown.

In a report made to the viceroy of Spain, during the early settlement of the province of Arizona and Sonora, is found the following words: "A scientific exploration of Sonora, with reference to mineralogy, along with the introduction of families, will lead to a discovery of gold and silver so marvelous, that the result will be such as has never yet been seen in the world." The Spanish race have but touched these treasures. It remains for the American people to make good the prediction.

DEPARTMENT OF STATISTICS.

AMERICAN AGRICULTURE.

(Continued from p. 57.)

The area of our territory, as I have already remarked, is about three millions of square miles. Without proposing to do more than refer to the prominent features of our physical geography, I may remark that the calculations of the Topographical Bureau at Washington, show the existence of an interior valley drained by the waters of the Mississippi and its tributaries, nearly as large as the Atlantic and Pacific slopes together, and one-third larger than the whole domain of the Republic on the adoption of the Constitution.

The following table shows the area of each slope, and its ratio to the total area of the United States:

Territory.	Area in Square Miles.	Ratio of Slope to total Area of the U. S.
Pacific Slope	786,002	26.09
Atlantic Slope, proper.....	514,416	17.52
Northern Lake Region	112,649	3.83
Gulf Region.....	325,537	11.09
Mississippi Valley, drained by the Mississippi and its tributaries	1,217,562	41.47
Total.....	2,956,166	100.00

Thus, over two-fifths of the national territory is drained by the Mississippi and its tributaries, and more than one-half is embraced in what may be called its middle region. One-fourth of its total area belongs to the Pacific, one-sixth to the Atlantic proper, one twenty-sixth to the Lakes, one-ninth to the Gulf—or one-third to the Atlantic, including the Lakes and Gulf.

As connected with the facility of water transportation, it may be interesting to add, that a calculation made at the office of the Coast Survey for 1853, gives for the total main shore line of the United States, exclusive of sounds, islands, &c., 12,609 statute miles, of which 54 per cent. belongs to the Atlantic coast, 18 to the Pacific, and 28 to the Gulf coast; and that if all these be followed, and the rivers entered to the head of tide-water, the total line will be swelled to 33,069 miles.

The general character of the soil between

the Mississippi river and the Atlantic is that of great fertility, as also that on the western side of the Mississippi, as far as the 98th meridian, including the States of Texas, Louisiana, Arkansas, Missouri, Iowa, and Minnesota, and portions of Kansas and Nebraska; but from that meridian westward to the Rocky Mountains, and thence nearly to the Pacific, excepting the rich and narrow belt already alluded to along the ocean, is found in some parts a waste utterly barren, and generally the land is unfit for the support of an ordinary civilized community. Of the entire area of the United States, only about one-thirteenth part is improved; about one-eighth more is occupied but not improved. The entire number of acres occupied is 293,560,614, or nearly one-sixth part of the national domain.

The olden theory in regard to the soil first occupied by settlers, broached by Ricardo and Malthus, and for a long time adopted without question, was that the best lands were first occupied by the pioneers of civilization; but this has been refuted by Mr. Carey, whose careful array of facts gathered from the history of various nations, including our own, seems to show conclusively that the richest lands are the last to be cultivated, and hence we may conclude that among the unoccupied portions of our country, there remains soil of greater fertility and ultimate value, than is to be found in the thirteenth portion now under actual cultivation.

The States and Territories among which these lands are divided, are forty in number, besides the District of Columbia, including within their organization 1,620 county divisions.

The total number of farms and plantations in 1850 was 1,449,075; the number of improved acres 113,032,614, and of unimproved 180,528,000; the farms average 203 acres, and in value \$2,258. The implements and machinery on each farm average in value \$105. The proportion of improved land in the different sections of the country is as follows:

In New England, 26 acres in 100.
In the South, 16 " "
In the North-West, 12 " "
In the South-West, 5 " "

In the South, the number of acres to the farm is the largest, but the value is greatest in the Middle States. The average value of the Union is \$11 04 per acre, ranging from \$1 41 in Texas, a fraction more in California, and \$5 34 in the Southern States, to \$11 39 in the North-Western States, \$20 27 in New England, and \$28 07 in the Middle States.

These farms, with occasional exceptions, as

among the ancient manors of New York, of late conspicuous for anti-rentism, are owned in fee by the cultivators, and this rule constitutes an essential element of difference in comparing American agriculture with that of England, where the cultivators are nearly uniformly tenants, generally under terms of longer or shorter continuance, and sometimes at will, causing a separation and occasional clashing of those interests of the landlord and the farmer which are with us united in the same person.

What influence this difference may exert upon the character and progress of agricultural improvements, and how far the superior wealth, and to some extent, more liberal education of English landlords, is counterbalanced by the individual energy and enterprise fostered in America, by an undivided interest, are interesting questions that will be probably elucidated by a comparison of future returns.

The census of 1840 did not ascertain the number of acres of improved land in the United States, so that there are no data showing the increase during the last decade. The report of the Secretary of State for 1856, gives the following statement for the year 1850.

	Acres.	Crops.	Value.
Indian Corn.....	31,000,000	592,071,104 bush.	\$296,035,552
Pasture Lands.....	20,000,000		
Hay.....	13,000,000	13,838,242 tons.	139,392,420
Wheat.....	11,000,000	100,455,944 bush.	90,437,260
Oats.....	7,500,000	146,584,179 "	51,304,463
Cotton.....	5,000,000	973,317,200 lbs.	75,265,376
Rye.....	1,200,000	14,186,913 bush.	9,932,169
Peas and Beans.....	1,000,000	9,219,901 "	6,314,925
Irish Potatoes.....	1,000,000	65,797,595 "	26,319,156
Sweet Potatoes.....	750,000	33,267,148 "	19,134,074
Buckwheat.....	600,000	8,956,912 "	5,374,147
Tobacco.....	400,000	199,752,655 lbs.	11,983,159
Sugar.....	400,000	237,133,000 "	9,483,320
Barley.....	300,000	5,167,015 bush.	3,875,261
Rice.....	175,000	215,313,597 lbs.	4,306,270
Hemp.....	110,000	34,871 tons.	4,184,820
Flax.....	100,000	7,809,676 lbs.	624,744
Gardens and Orchards.....	1,000,000		13,003,216
Vineyards.....	250,000		442,498
Other products.....	1,000,000		
Improved, but not in actual cultivation.....	17,247,614	221,249 gall.	
	113,032,614		

Another table, from the Compendium of the Census, page 176, giving more fully the values of the agricultural products of the United States for 1850, including the annual products of live stock, &c., makes the total for that year thirteen hundred millions, and the total for 1854 was estimated at sixteen hundred millions.

This table shows us that in 1850 the four largest staples of our country, ranking them according to their annual value, were—

Indian Corn.....	\$296,000,000
Hay.....	138,000,000
Wheat.....	90,000,000
Cotton.....	78,000,000

Before proceeding to note some further statistics in regard to Indian corn, or as it is sometimes called, *maize*, let me briefly mention the doubt expressed at a recent meeting of the British Association, whether this grain is strictly a plant of the New World, and allow me to refer to the evidence that proves it, as we think conclusively, to be a native grain.

Stress was laid in the British Association on the fact of its occurrence in the floral decorations of Rome in the time of Raffaele; but it was said in reply that botanists had always regarded it as a plant of the New World, and the evidence on this point adduced by Alfonse De Caudolle in his great work on the geographical distribution of plants, was quite complete; and it was sensibly suggested that if it had been a plant of the Old World they could scarcely have failed to raise it, and that Raffaele's painting it might be accounted for by the interest with which all the products of the New World were then regarded. It is referred to by the most ancient Peruvian historians; it was cultivated by the aborigines in the time of Columbus, and is still found growing in a wild state from our Rocky Mountains to the forests of Paraguay. The venerable Baron Humboldt, whose eminent authority may be regarded as settling the question, says: "It is no longer doubted among botanists that *maize* or Turkish corn is a true American grain, and that the old continent received it from the new."

Indian corn is pre-eminently the great staple of the country, surpassing all others in the area of its cultivation, and in the amount and value of the crop, yielding in 1850, within a fraction of three hundred millions of dollars, being all but equal to the united values of the three next staples in their order, wheat, hay and cotton; and as Indian corn is not only the most important, but the most universal crop, extending from the northern to the southern limit of the

United States; its cultivation would seem to afford a better test than that offered by any other of the progress of American tillage.

In the production of Indian corn no state has retrograded. The crop in 1840 was nearly four hundred millions of bushels; in 1850 it was within a fraction of six hundred millions, being a gain of 56 per cent., while the increase of the population, during the same time, was only 35 per cent. The estimated crop for 1855, according to the Secretary of the Treasury, was between seven and eight hundred millions, or nearly double the crop for 1840, and the crop for 1856 was estimated at fully eight hundred millions of bushels.

One of our distinguished agriculturists, Prof. Mapes, in an interesting lecture on Indian corn before the American Institute, has remarked that it may be said of our corn crop, as Mr. Webster said of the turnip crop of England, that its failure for three successive years would nearly bankrupt the nation.

It is with us a staple food of men and of animals. To it we are indebted in part for our beef, and in a very large proportion for our pork. In the far West it is fed largely to cattle and pigs for the more convenient exportation of the produce of the country. The number of hogs fattened on it nearly equals the number of inhabitants, and their land has become a staple article of export. The sugar estates in the West Indies are reported to be mainly supported by American Indian meal, and its use is extending in Ireland, England, and throughout the world. In 1850, somewhat more than eleven millions of bushels were consumed in the manufacture of malt and spirituous liquors.

While the value of the corn crop has increased so rapidly, the wheat crop, from 1840 to 1850, according to the census, had increased only 15 per cent. It was suggested in the report of the Patent Office for 1852 and '53, that this crop would have shown an equal advance with that of Indian corn, had it not been badly damaged, especially in the North-Western States, before the harvest from which the census was taken; but the statistics of subsequent harvests in particular States seem to render this supposition improbable.

The breadth of land in the United States, suited to the wheat crop, is comparatively small, and in the older States would appear to be diminishing.

In New England the culture of wheat is rapidly declining; in the Middle States it is nearly stationary, the increase for the ten years previous to 1850 being only about fifteen per cent.

In the North-Western States its culture has rapidly increased; and it is from this district that the largest supplies for export are derived.

Chicago, which, twenty years ago, imported flour and meal for her own consumption, has established brands of flour, which are now recognised throughout Europe; and she is shown by recent statistics to be the largest primary grain depot in the world, rivaling Odessa and Galatz, Dantzic and St. Petersburg, while she leads all other ports of the world also in the quantity and quality of her exports.

The population of Chicago, which, in 1850, was 29,000, in 1856 had increased to 104,000.

The census of New York for 1855 shows that her wheat crop, once so famous, is actually decreasing, owing, as is supposed, in part to the ravages of insects, and in part to diseases of the plant, assisted, perhaps, by a gradual deterioration of the soil.

The wheat crop in New York was 12,286,418 in 1840, and only 9,092,402 in 1855, a decrease of twenty-five per cent., while the crop of Indian corn, in the same State, increased during the same period from 10,972,286 to 19,299,691, or nearly 100 per cent., showing, when taken together, not a diminution in the bread crop of the State, for the joint increase is five millions of bushels, but simply a partial substitution of Indian corn for wheat.

In no country can a bread crop be raised with less labor than Indian corn generally throughout the United States, and it is estimated that the same amount of toil of a man and horse which will raise a bushel of wheat in England will raise ten bushels of corn on favorable soil in this country.

The Patent Office Report for 1855, in an interesting paper, by Mr. D. J. Browne, shows that a comparison of the nutritious values of corn and wheat, ranging at from two to three times the price of a bushel of corn, gives a decided preference to the corn; and this fact has, doubtless, had its influence in extending its consumption among our people.

But as yet neither this fact nor the other excellencies of corn meal are appreciated in Europe; and the exports of this grain are very much less than those of wheat. In 1854 the proportions were \$40,000,000 worth of wheat to \$7,000,000 worth of corn. Experiments in the preparation of corn are being made by the Government of Prussia, and elsewhere in Europe, which will probably result in its more rapid introduction as a staple article of food.

Looking at the aggregate exports of the country for the past year, 1857, to learn the

proportion due to the culture of the soil, we find them to be as follows:

The Sea	\$3,739,644	Cotton	\$131,575,859
" Forest	14,699,711	Raw produce ..	3,421,447
Agriculture	75,069,634	Manufactures ..	30,139,646
Tobacco	20,260,772	Specie & bul'n	60,078,352

Total value of exports \$338,985,065
of which there was due to the culture of the soil (agriculture, tobacco and cotton) \$220,661,832, or more than two-thirds of the sum total.

Comparing this amount with the exports due to the culture of the soil in 1847, we find that they were in that year \$131,000,000, the increase for the ten years being more than 70 per cent.

The exports of breadstuffs for the last 15 years have singularly fluctuated, and, although their large increase from \$27,701,121, in 1846, to \$68,701,921, in 1847, and their fall again, in 1848, to \$37,472,751, may be accounted for by the Irish famine of 1847, arising from the potato rot and short crops generally; it seems less easy to account for the differences in the exports of the last five years. They were in

1852	\$25,857,027
1853	32,985,322
Rising, in 1854, to	65,941,323
Sinking, in 1855, to	38,895,348
And rising, in 1856, to	77,187,301

They must be owing, however, to fluctuations in the home supply, as well as in the foreign demand, affected as the latter has recently been by European and Eastern wars, and the consequent suspension of trade with the Baltic, as the average export price of flour from the country, as ascertained by the Treasury Department for the years in question, throws little light upon it.

That price was as follows:

1852	\$4 24
1853	5 60
1854	7 88
1855	10 10

A statement showing the actual average export price of flour at New York from the year 1800 has been published by the Department.

It is desirable that the causes of such fluctuations should be ascertained as nearly as possible, for, while unexplained, they are calculated to excite doubts in regard to the certainty of agricultural profits, and the element of uncertainty, wherever found, is calculated to discourage and to deter.

Passing, from the great staples of wheat and Indian corn to the other agricultural products

of the country, a comparison of the census of 1840 with that of 1850 gives us these general results.

And, first, as regards Stock:

The number of horses, asses and mules, had increased in number something more than half a million, the total in 1850 being 4,896,650. The number of horses had not increased as rapidly as other stock, in consequence of the extension of railroads lessening their demand for the purposes of travel; but, in the newly-settled States, where railroads were but commencing, the increase of horses had kept pace with the population. There is about one horse to every five persons in the United States. The 500,000 asses and mules returned are almost confined to the Southern States, where the climate is regarded as better adapted to this animal than the horse.

The neat cattle had increased nearly three and a half millions, and numbered 18,378,907, of which 6,385,094 were milch cows, 1,700,744 working oxen, and 10,293,069 other cattle.

The rate of increase of neat cattle for the ten years was about twenty per cent. The amount of butter produced in 1850 was 313,266,962, and of cheese 105,535,219 pounds. The average value of the exports of these two articles, from 1845 to 1850, was about one million and a half of dollars.

Swine had increased four millions, numbering in 1850, 30,354,213.

Sheep had increased two and a half millions, and numbered 21,723,220.

In New England there was a remarkable decrease in their number, from 3,811,307, in 1840, to 2,164,452, in 1850, a decrease of 45 per cent. In the five Atlantic or Middle States, New York, New Jersey, Pennsylvania, Delaware, and Maryland, taken together, there was a decrease of 22 per cent. The augmentation has chiefly been in the States south of Maryland, and west of New York.

The returns of wool were as follows:

1840	35,802,114 pounds.	\$11,345,318
1850	52,516,959 "	15,755,088
1855	61,560,379 "	23,392,944

an increase of about 46 per cent. The average weight of the fleece yielded by each sheep was, in 1840, 1.84 pound, and in 1850, 2.43, indicating a great improvement in the breed. This improvement is chiefly shown in the returns relative to Vermont, Massachusetts and New York.

The total value of live stock in the United States in 1855 was \$544,189,516, and the value of animals slaughtered, \$111,703,142.

The grain, root and other crops, from 1840 to 1850:

Rye had decreased from 18,645,567 bushels to 14,188,813.

Oats had increased from 123,071,341 bushels to 146,584,179.

Potatoes (Irish and sweet) had decreased from 108,298,060 bushels to 104,066,044.

Hay had increased from 10,248,108 tons to 13,838,642.

Hops from 1,238,502 pounds to 3,497,029 in 1850, and, as estimated by the Secretary of the Treasury, to 4,820,752 in 1855, indicating a rapid increase in the consumption of Lager-beer.

Cotton had increased from 799,479,275 pounds in 1840 to 978,317,200 in 1850, and to 1,089,409,908 in 1855.

Rice from 80,841,422 to 215,313,497, while Tobacco has decreased from 219,163,119 pounds to 199,752,655.

Wool had increased from 35,802,114 pounds to 52,516,959.

Silk Cocoons had decreased from 61,652 pounds to 10,843.

Wine had increased from 124,734 gallons to 221,249.

From a table of the actual crops per acre in the different States, it would seem that there is a diversity so great as to confirm the doubts in regard to its correctness frankly intimated by the compiler, who states that nothing better can be framed from the returns, which, in general, were very carelessly made, or entirely neglected.

In Wheat we find the average number of bushels to the acre to be 5 in Alabama and Georgia, 7 in North Carolina, Virginia and Tennessee, ranging upwards in the other States until it reaches 12 in New York, Ohio and Indiana, 13 in Maryland and Vermont, 14 in Iowa and Wisconsin, 15 in Florida, Pennsylvania and Texas, and 16, the highest average, in Massachusetts, being three times the average of the lowest.

In Rye we find the average of bushels to the acre to be 5 in Virginia, 7 in Georgia and Tennessee, 8 in New Jersey, 17 in New York, and 25 in Ohio, or five times the lowest average.

In Indian Corn we find the lowest average to be 11 bushels to the acre in South Carolina, 15 in Alabama, 16 in Georgia and Louisiana, 17 in North Carolina, 18 in Mississippi and Virginia, and so rising upwards until it reaches 27 in New York and Maine, 32 in Vermont and Iowa, 33 in Indiana, Illinois and New Jersey, 34 in Missouri, 36 in Ohio, and 40 in Connecticut, some three and a half times the lowest average.

In Oats we find the lowest average, 10 bushels to the acre in North Carolina, 12 in Mississippi, South Carolina and Alabama, 13 in Virginia, 18 in Arkansas, Georgia and Kentucky, 20 in Delaware, Indiana and Maine, 21 in Connecticut, Maryland and Ohio, 22 in Pennsylvania, 25 in New York, 26 in Vermont, New Jersey, Missouri, Michigan and Massachusetts, 29 in Illinois, 35 in Wisconsin, and 36 in Iowa.

Of Rice we have returns only from three States, Louisiana giving 1,400 pounds to the acre, South Carolina 1,750, and Florida 1,850 pounds.

Sweet Potatoes vary in quantity from 65 bushels to the acre in Texas to 175 in Louisiana, 200 in Alabama, and 400 in Georgia.

Irish Potatoes yield 65 bushels to the acre in North Carolina, 75 in Maryland, New Jersey, Ohio and Pennsylvania, 100 in Indiana, Iowa, New York and Rhode Island, 120 in Maine and Tennessee, 125 in Georgia and Wisconsin, 130 in Kentucky, 140 in Michigan, 170 in Massachusetts, 175 in Florida, 178 in Vermont, 230 in New Hampshire, 250 in Texas.

In this table particularly it is difficult to account, except on the supposition of error, for so large a difference in the average yield per acre between States so alike in character as Alabama (60) and Georgia (125), or between Connecticut (85), Vermont (178) and New Hampshire (230).

No question, perhaps, connected with American Agriculture is of more general interest and importance than the measure of profit which may reasonably be expected from capital invested in farms, and managed with that degree of skill and industry, which are the recognised requisites to success, in the various branches of commerce and of manufactures, in the trades and learned professions.

It has been truly remarked, that "mankind have a habit of graduating the rank of labor by the recompense it receives;" and it is undoubtedly the conviction that agricultural labor is less profitable than many other employments pursued in cities and large towns, that induces so many thousands of our ambitious and energetic youths, especially in New England and the Atlantic States, to forsake their rural homes, and the half-cultivated farms of their fathers, in the hope of more rapidly achieving independence, and perhaps fortune, in communities where every branch of trade is already over-crowded with anxious competitors.

The same idea is not unfrequently entertained by capitalists. The common belief seems to be, and it is, doubtless, founded upon common experience, that the profits of farming op-

erations are very moderate, and that it is idle to expect more than a small per centage from capital thus invested. A contrary belief is usually attributed to an undue enthusiasm with no basis of fact, and occasional instances of large profits are regarded as extraordinary exceptions, that are to be attributed to local and special causes, and are not, therefore, to be allowed any weight in the support of a general theory.

It is most desirable that accurate statistics in regard to the fair profits of capital invested in agriculture, after just allowance for the industry required for its development, should be gathered from all sections of the country, and it would be well if some inquiries to this end were embodied in the Agricultural schedules for the approaching census.

The fact is as yet but imperfectly appreciated among us, that Agriculture, which, in its origin, was but an art, has been gradually raised to the dignity of a science; and now, thanks to the discoveries of the great practical and analytic chemists, in Europe and America, of whom Liebig is the chief, stimulated and aided by the mechanical invention, for which our age and country are so remarkable, it occupies a position of pre-eminence unknown during the last century.

"There is, I believe," says Mr. Everett, "no exaggeration in stating that as great an amount and variety of scientific, physical and mechanical knowledge is required for the most successful conduct of the various operations of husbandry, as for any of the arts, trades, or professions."

Assuming this position to be correct, it is clear that no amount of evidence in regard to the profits of farms conducted by men wanting in this wide range of scientific, physical and mechanical knowledge, can determine the profits that may be reasonably expected from farms of the like capability, where that varied knowledge institutes and guides every operation.

But there is reason to believe, that while the limit of Agricultural profits generally throughout the country is as much below the line it is capable of reaching, as the present standard of Agricultural education is below that high standard to which Mr. Everett directs the ambition of the American farmer, there are good grounds for the opinion, that, with the increase of an Agricultural literature, the diffusion of books and newspapers, of farmers' clubs, of State, county and town, Agricultural societies, of national and local fairs and exhibitions, there is a perceptible and rapid improvement in the rural economy of the country, in the intelligent

culture of the soil, and in the profits of Agricultural capital.

So long ago as 1795 Mr. Burke placed the profits of a proprietor of 1,200 acres at 12 per cent. Sir John Sinclair, a quarter of a century later, declared the proper profits at 10 to 15 per cent. M. Rives, of Virginia, by whom these facts were mentioned in a very interesting Agricultural address, stated the profit of the model farm of Gignon, near Versailles, at 14 per cent. The "*Revue des deux Mondes*" for February 15th, 1858, in an article entitled, "Les Questions Agricoles en 1848," mentions that the net profits of the farm at Bresles, in the department of the Oise, rose, in 1856, to 246,000 francs upon a capital of 800,000, being more than 30 per cent.

Occasional accounts in our Agricultural papers indicate a rate of interest, which, if verified as one that could be reasonably anticipated with a due share of skill and industry, would immediately induce the investment of millions of capital in Agricultural operations, to the benefit of the country at large, as well as to the individuals making the advances.

One point that should not be lost sight of in a consideration of the advantages attendant upon Agricultural operations is the safety of the capital invested, compared with the chances of loss attendant upon commercial and manufacturing investments. The Hon. Emory Washburne, of Massachusetts, in an address before the Worcester Agricultural Society, in 1854, stated some facts bearing upon the question, which a statistical inquiry, if one could be accurately made, into the successes or reverses of the various pursuits in which our countrymen engage, might probably multiply to an extent, that, without proof, would hardly be credited. Of the merchants in Boston doing business at a certain wharf during forty years, only six became independent, the remainder failed or died destitute of property. Of one thousand merchants, having accounts at a principal Boston bank during the same years, only six had become independent.

Another investigation led to the startling result, that of every hundred traders, but seven succeed in acquiring wealth. From such reverses the farmer is comparatively free. Of eleven hundred and twelve bankrupts who took the benefit of the bankrupt law in Massachusetts, only fourteen were farmers; and of twenty-five hundred and fifty bankrupts in New York only forty-six were farmers. Less than two per cent. of the bankrupts belonged to the Agricultural population, although that population so largely exceeds all the rest of the people however classified.

At the present moment, when the leading manufacturing interests of the country are in a languishing condition from their recent reverses, and the conviction is generally felt of the precariousness of their profits for the future, dependent as those profits are upon the varying policy of opposing parties; the claims of Agriculture upon the attention of capitalists, as well as statesmen, are likely to be more fairly scrutinised than when commerce and manufactures were in the full tide of success. Should the schedule for the approaching census include the question of Agricultural profit in such a form that the returns may afford reliable data for prudent calculations, the next decade may perhaps see an investment of capital from the Atlantic States, in the cultivation of wheat and corn in our western valleys, to an extent that shall materially swell our exports of breadstuffs, and constitute them the chief element in our foreign exchanges.

Much has been said of late years of a gradual deterioration of the soil in the older States, as evinced in part by the decreasing ratio of crops to the acre, as compared with the ratio in former years, and with the usual ratio in other countries.

Mr. Morrill, M. C., of Vermont, by whom a bill has been introduced into the House of Representatives designed to grant to the several States some ten millions of acres to be divided amongst them in proportion to the number of senators and representatives they send to Washington, with the view of promoting Agricultural education and Agricultural science, by the establishment of an Agricultural college in each State, has made some startling statements upon this subject. He affirms that Agriculture is rapidly declining in every State of the Union, that the quantity of food produced bears each year a smaller proportion to the number of acres under cultivation, and that over a very wide area some of the most useful crops bid fair to become extinct.

A writer in the "Year Book of Agriculture for 1855," on the "Alarming Deterioration of the Soil," referred to various statistics of great significance in connection with this subject. Some of them regarded Massachusetts, where the hay crop declined 12 per cent. from 1840 to 1850, notwithstanding the addition of 90,000 acres to its mowing lands, and the grain crop absolutely depreciated 6,000 bushels, although the tillage lands had been increased by the addition of 60,000 acres.

In Indiana the river bottoms which used to produce an average crop of sixty bushels of corn

to the acre, now produce but forty. In Wisconsin, which is younger still, it is estimated that only one-half the bushels of wheat are now raised to the acre that were raised twelve years ago; and the writer declares as the conclusion of the whole matter, "that the soils of New England, after all the admonitions we have received, are annually growing poorer, and that *even the virgin lands of the great West* are rapidly becoming exhausted by their fertility."

He refers to the large falling off of the wheat and potato crops in New England, which have however been replaced by Indian corn, and also to the falling off of wheat in Tennessee, Kentucky, Georgia, and Alabama, to the extent of 60 per cent. from 1840 to 1850, and assumes that the agricultural statistics of each State tell the same sad story.

As regards a falling off in the production of the country, I think it is clear from a comparison, not of wheat and potatoes alone, but of the total products of the soil, especially of Indian corn, in 1840, with that of the same crops in 1850, that Mr. Morrill is mistaken; but as productiveness of crops and destructiveness of soil are said to be the two most prominent features of American agriculture, the largest harvests in our young States ought not to blind us to the fact that the fertility of those parts of the older States which once yielded as abundantly, seems to have been steadily diminishing for a long course of years.

This fact is exhibited, not only in the wheat lands of New England, and other parts of the North, but on the tobacco fields of Virginia, and the cotton plantations of the South; and the subject undoubtedly deserves the most careful investigation.

The deterioration of our soil is doubtless owing, in a great part, to a careless system of cultivation, common to new countries where land is cheap and labor is dear, and the soil is naturally productive, and the individual cultivator is intent upon large immediate returns, thoughtless of the permanent fertility of his farm, careless of the interests of his successors, and regardless of the prosperity of the community at large. It has been suggested that every agricultural people runs the same race of exhausting culture, shallow plowing, a continuous course of impoverishing, with neither rest, rotation, nor sufficient manure; and that necessity alone can convince them that duty and interest both demand, that land shall be so tilled as to increase rather than diminish in fruitfulness. Such a necessity, in the lessening crops of the Atlantic States, and westward emigration in search of more fertile territories,

ready presents itself to the intelligent American agriculturist: and the reasonable belief at the same exhaustive system will soon begin to tell upon the most productive regions of the West, has led to the discussion in agricultural newspapers, and at farmer's clubs, of the philosophical causes of the exhaustion, and the best means of renovation.

In some sections of the country, efforts to restore exhausted lands have been attended with the most marked pecuniary success. Mr. Rufin, of Virginia, estimates the increased value of reclaimed lands in Eastern Virginia, by marling and liming, from 1838 to 1850, at some thirty millions of dollars. In the well known case of a success from claying a light soil by the celebrated Coke of Norfolk, afterwards Earl Selsey, that gentleman doubled the value of his estates in Norfolkshire; and among numerous instances of immense improvement simply from drainage and deep plowing, with but little aid from fertilizers, may be mentioned one cited by Prof. Johnston, of the Home farm at Yestees, belonging to the Marquis of Tweeddale, where the land, by these means, was raised in value eight times—from 5 shilling to 40 shillings rent per acre.

There are no reliable data from which we can now gather the progress of deterioration in productive lands in the United States, or the reclamation of exhausted lands; but the rapid increase in the use of *guano*, the most powerful of restoratives, indicates to some extent the increasing attention paid to fertilizing.

The consumption of *guano* for 1854, as stated by Prof. Mapes, was about 140,000 tons. The amount sold in England, during the year 1855, was stated by Mr. Nesbitt at 210,000 tons, being an increase of twenty per cent. on the consumption of 1854, which was also an increase of twenty per cent. over that of 1853; this increase has taken place in the face of a rise in the price, from forty-five to about eighty dollars per ton.

It would seem proper that the schedules for the new census, should embrace inquiries in regard to the deterioration or improvement of the soil, which may be shown, not only by the ratio of crops to the acre at successive periods, but by the market value of the same lands at stated intervals; and that the schedules should also exhibit generally the quantity and prices of the various fertilizers in use—barn-yard manure firstly and chiefly, then *guano*, *poudrette*, lime, gypsum, marl, muck, and so forth, that are yearly devoted to the enrichment of our soils. Upon this item of manure, insignificant as it might seem to the unreflecting mind, de-

pends the continuous prosperity of our country. This is the secret of England's agricultural wealth. Mr. Webster, in his sketch of English agriculture, quoted the extraordinary fact stated by M'Queen, "that the value of the animal manure annually applied to the crops in England, at current prices, surpasses in value the whole amount of its foreign commerce," and he added, "there is no doubt that it greatly exceeds it."

The schedules might also advantageously give us, not simply the amount of new lands brought into cultivation, but of the worthless lands that have been reclaimed by drainage.

In almost all the States extensive tracts of swamp lands are found, not only unfit for cultivation, but frequently inducive of that fearful scourge of health and happiness, fever and ague, that year after year prostrates the energies, and shortens the lives of tens of thousands of our countrymen.

Large grants of these swamp lands have been gratuitously made by the Federal Government to the States, in the hope of their reclamation through measures to be adopted by the State Government. Since 1849 nearly sixty millions of acres have been thus granted. In the drainage of large tracts of land we have the benefit of the experience of Europe, especially of Holland, where the Harlem Lake, thirty-three miles in circumference, and thirteen feet deep below the tide, has, since 1839, been converted into a most fertile tract, occupied by some two thousand inhabitants, and exhibiting fields of verdure dotted with numerous cottages, and enlivened by cattle, horses and sheep, grazing on the fruitful meadows. The lands thus reclaimed from the ocean are of extraordinary fertility, and are estimated as capable of supporting seventy thousand persons.

Of the pecuniary results of drainage in this country, Gov. Wright, of Indiana, quoted an example in a public address, touching the marshy lands of that State, embracing three thousand acres. He mentioned a farm of 160 acres which had been sold at five hundred dollars, and, after an expenditure of two hundred dollars in drainage, was worth upwards of three thousand dollars, or an advance of more than 500 per cent.

But, apart from these large tracts of overflowed lands, scarcely a farm in the country but would be improved by thorough drainage, and it would not be difficult to ascertain the number of acres under-drained in each year of the census, nor the estimated additional value which they thereby received.

Looking at the acreage now devoted to In-

dian corn, to say nothing of our other crops, it has been estimated that by the adoption of an improved system of agriculture, embracing drainage, deep ploughing and skillful manuring, the entire crop now yielding 400 millions of dollars, might, upon the same breadth of land, be trebled if not quadrupled. At present, with occasional exceptions, our average crops per acre are even less in our most fertile and almost virgin States than in the soil of Europe, that has been cultivated for centuries.

Take wheat, for instance. The average crop per acre in New York, Ohio and Indiana, is 12 bushels; in France it is 13; in England, 21; in Flanders, 23; in Scotland, 30 (on the authority of Professor Johnston); and in New Brunswick, 19.

How the average might be increased throughout this country by careful culture, we may, in part, learn from the returns of occasional crops in England of seventy bushels, in New York of sixty, on the prairies of forty-four, and at San Jose, as is reported, of eighty-seven.

Yet another topic closely connected with the interests of American agriculture is the recent diminution of the proportion of the male population engaged in agricultural pursuits, as compared with the number engaged in commercial and other pursuits. The precise ratio of that diminution cannot be ascertained from the census, for the reason that the tables of 1850, on the leading occupations of the people, were based upon the whole number of male inhabitants over fifteen years of age, including all the free males, and three-fifths of the male slaves; whereas the former tables of occupation, made in 1840 and 1830, were based upon the entire population. The census of 1840 made the portion engaged in agriculture 77.4 per cent. for both sexes, that of 1850 only 44.69.

There is, therefore, reason for believing that the proportion of the population devoted to agricultural pursuits is decreasing; and it is important that the schedules of the next census should be drawn with reference to the determination of this point with entire accuracy, and should develop whatever facts may be essential, to enable us to discover, and if possible to correct, the causes that may be diverting an undue proportion of American industry from the culture of the soil.

The attractiveness of town and city life for the laboring classes may be lessened by a study of the tables of mortality, showing that the average duration of life is much larger in the rural districts.

In England the average duration of life is

forty-five years in Surrey, but only twenty-five in Manchester and Liverpool.

A paper, by Mr. Edward Jarvis, on vital statistics at Dorchester, in Massachusetts, read before the British Association in January, 1840, showed that, out of 1,700 persons,

The average life of farmers was	.....	45 years.
" " merchants	.....	33 "
" " mechanics	.....	29 "
" " laborers	.....	27 "

Looking from the average years of life to the increase of the male population, we find it stated that in Massachusetts, among the cities and towns, it is 6 per cent., while among the agricultural population it is 9 per cent., a difference of male births in favor of the rural districts of 33½ per cent.

These facts, if verified by the national statistics, and brought home to the consciousness of the people, are certainly calculated to restrain a preference for the crowded streets and impure atmosphere of our cities, over the broad fields and bracing air of the country; and the feverish anxiety for rapid gains in mercantile pursuits, may be advantageously checked by statistics showing the uncertain gains of commercial speculations, and the certain profit of enlightened agricultural toil.

The leading facts at which we have glanced, of an increasing foreign demand for breadstuffs, the limited breadth of our arable land, which thousands of our citizens have been taught to regard as inexhaustible, the gradual deterioration of the soil from a wasteful system by which the constituents of fertility are removed with each successive crop, without being restored by appropriate manures—a system based upon the desire for immediate gains, without thought of the sacred duty that devolves upon us to transmit the soil to our posterity, with undiminished productiveness, that it may sustain in comfort and happiness the unnumbered millions that are presently to occupy our land; these and similar considerations connected with the present and future prosperity of our country, appealing at once to the interest and the patriotism of the nation, may be so elaborated and diversified, and verified by the tables of the census, that its returns shall teach us not simply lessons in political economy, but lessons of daily duty, the benefits of which shall be reaped alike by the present and future generations.

There are various topics connected with American agriculture, on which I would like to touch, did time permit me. One, the recent and rapid introduction of improved agricultural machinery, soon, probably, to be followed by

the use of steam ploughs and other machinery worked by the same motor, overcoming, to a great extent, the chief difficulty of the American farmer in the high price of labor; that feature of our agriculture which constitutes so marked and essential a difference between the practical agriculture of America and Europe.

Another is the spread of agricultural science, through the efforts of the patent office distributing their reports and seeds gathered from Europe; through the multiplication of books and papers devoted to the subject, and by county, state and national societies and farmers' clubs, in their frequent meetings, addresses, and exhibitions of agricultural implements and products.

What the country now most requires in reference to its agriculture, is, that its condition should be faithfully photographed in the returns to each federal census, and it will be for the agricultural section of this body to prepare well-considered suggestions for the new schedule, and submit them to the Federal Government. Such suggestions will appropriately come from the American Geographical and Statistical Society, in view of its national character and the scope of its labors; and such suggestions, judging from the past, the Federal Government will cheerfully receive and carefully consider.

Among the additional items which might advantageously be included in the schedules, I would suggest the following:

As regards persons employed in farming.—The proportion of the population thus employed of both sexes. Their average life, as compared with that of persons living in towns, and of other trades.

As regards capital employed in agriculture.—Not only the proportion invested in land, stock and implements, but the profit thereon received during the year immediately preceding the census.

As regards the farms.—Not only the improved and unimproved lands, and the proportion in meadow, pasture or tillage, but the number of acres of each farm that have been drained; the number requiring draining; the number drained during the last year; the cost of draining, and the value of the land before and after.

In regard to the improvement or deterioration of the soil.—The average of each crop, and cost of each per acre; the average of bushels or tons to the acre, and the cash value of each on the spot.

In regard to manures.—The amount, variety, and cost of those applied during the last year, and the rate of cost per acre.

Other suggestions will, doubtless, be made, a collation of which, by the Bureau of the Census, may afford us, in future years, the means of tracing the progress of American agriculture, and reading its actual condition at each decade, with the same facility with which a prudent merchant reads the past and present of his business in the carefully prepared balance sheet; and if the future of America shall continue to exhibit the same steadily progressive advance that we find in her past, the tabular results of each succeeding census, dry and uninteresting as they may seem to those who shall see in them but columns of figures, will in fact develop the fulfilment of some of those prophecies of the coming wealth and splendor of the Western Continent, that when occasionally uttered by our far-seeing economists, are apt to be regarded as the careless dreams of visionary enthusiasts.

MR. PRESIDENT AND GENTLEMEN, I cannot close this address, without remarking that the increasing application of natural science to rural economy, will closely connect the agricultural with the other sections of your body, and that our agriculture is the national interest which is to be chiefly benefited by their learned researches.

The late Prof. Johnston, of Edinboro', whom I was so happy as to know during his visit to this country, and whose admirable lectures in the United States have connected his name with American, as it was already identified with British agriculture, on one occasion dwelt upon the aid which the art of culture receives from every branch of science, and this association is, I trust, destined to verify the correctness of his remarks.

The section on Topography, embracing the physical geography of the continent, and the topography of the several States and Territories in detail, concerns, among much else that is interesting, the extent and character of our arable soil; our mountain elevations and depressions; our table-lands and low lands, and in connection with the section on Hydrology, will exhibit the influence of the ocean and the gulf, of our lakes and rivers, of tides, gulf streams, prevailing winds and storms on the capabilities of the country, and the practices and profits of its cultivators.

The sections of Geology and Meteorology have an equally direct bearing upon agriculture, in explaining the nature of the rocks and of the soil, the fall of rain, the necessity for irrigation and for drainage.

The section on Botany may materially aid the farmer, by teaching him the nature of the

weeds that check his progress; of the rust, smut and mildew which attack his cereals; of the cause, yet to be discovered, of the rot in the potato; of the mutual adaptation of the plants to the soil; of their special habits and natural structure, their increase and decrease in various localities.

The sections of Zoology and Animal Physiology embraces, by your classification, domestic animals and their commercial value, their various breeds, the rearing of stock, and it, perhaps, properly includes the agency of animal life in fertilizing the soil. That on Commerce relates to the transport and exports of bread-stuffs, and their relation to our foreign exchanges; that on Manufactures to our agricultural implements, enlarging our production by diminishing the necessity for human labor; and that on Finance, to our national wealth, of which agriculture is the most prominent feature.

We began, gentlemen, by recognizing in agriculture the largest material interest of our country, constituting the bulk of her wealth, and indicating, in no small degree, the physical comfort, the prosperity, and the civilization of our people.

We next considered its relation to less favored foreign lands, whose children look to us for food:—a relation that invests the quiet labors of our farmers with an interest beyond the seas, not simply in shaping commercial speculation, and regulating among merchants the price of bread, but in gladdening distant homes, in staying the march of famine and starvation, in allaying popular discontent, and even averting national revolutions.

After a survey of the area, the population, the products, and the statistics of our great American farm, of its home resources, its foreign markets, and its probable future, we close with the thought, that for the advancement of this great interest, which supplies millions with healthful and profitable employment, and other millions with their daily bread; canals and railroads intersect our continent, extending westward towards the far Pacific; ships whiten the ocean, and steam labors in a thousand forms. That to supply its workmen with fitting implements, inventive genius is ever wakeful, and mechanical skill unceasingly active. That in their behalf chemistry, by the crucible and analysis, is extorting from nature her hidden secrets; and science, in all her forms, is lending her skillful aid to perfect, in this advanced and advancing age, the art that was born with the creation, in the garden that was given to man to dress and to keep it.

We close with the thought, suggestive of thankfulness and good will, that all these agencies are at work for the benefit of our universal brotherhood, to lighten the primeval curse, and to compel from our common mother, for the benefit of the children of a common father, more varied and abundant harvests, with greater certainty and with lessened toil.

Let us reverently remember, gentlemen, in our study of the laws of Political Economy by the guiding light of Statistics, that the truths which we seek to discover, are a part of that universal law whose seat is the bosom of God, and whose voice the harmony of the world.

Nor let us ever forget, in the contemplation of our unparalleled blessings, that the happiness and prosperity of a nation depends infinitely less on their material wealth, than upon the observance of those great rights and duties which our fathers solemnly recognized when we took our place in the family of nations.

ON THE MANNER OF TAKING A CENSUS.

*To the Committee of Publication
of the Am. Geo. and Stat. Society:*

GENTLEMEN,—I propose herewith to communicate some of the results of my observation upon the difficulties to be encountered in taking a census of the population, and the statistics required by law to be obtained therewith. Having had the principal care of preparing the blanks and instructions, and of answering letters of inquiry, from the marshals appointed for taking the census of the State of New York in 1855, and the entire direction of the labor of preparing the returns of that census for publication, I could not fail of meeting with many of the difficulties that must attend every enterprise of this kind, and in a greater or less degree impair the accuracy of its results.

It is obvious that the preparation of the summaries and abstracts embodying these results, involves no source of error which is not under control; and that, with suitable precautions, and careful checks and revisions, no errors need to arise in this part of the labor. To secure accuracy in this service, it should be performed by competent persons under one general direction, and with uniform instructions for settling the various points of difficulty that are liable to arise. I am convinced that labor saving

methods may to a considerable degree be introduced, to facilitate this branch of the service, and that simple mechanical appliances may be used to advantage to expedite the work.

Our principal care must therefore be, to obtain correct returns from the marshals; and, omitting for the present, any discussion as to what these returns should embrace, I will limit this letter to a statement of what appear to be inherent, and, to some extent, unavoidable difficulties, that will be found attending this all-important duty. There can be no doubt but that the census takers have been overcharged with duties that might better be performed by other persons, and in a different way. There is not an inquiry they are required to make, which is not important in its place, or which is not useful to the legislator, and of value to the statistician and the civil economist. But when we add to the minute inquiries of personal statistics, the registration of births, marriages, and deaths, for the year or the ten years previous—the minute statistics of agriculture and manufactures, in their immense combinations and details—statistics of dwellings—of churches and religious societies—of schools and school-houses—of newspapers and periodicals—and of such new points of inquiry as each succeeding census has had appended to its schedules, it will not be deemed amiss to rank as first on the list of desiderata, a high degree of qualification on the part of those charged with making the enumeration. As these persons are not in all cases selected from any peculiar fitness they are thought to possess, it will sometimes happen that they will fail to appreciate, or neglect to perform some part of their duties, and their returns will show palpable deficiencies in some one or more particulars.

These defects are perhaps due less to the census marshals than to the law; and while I would not abridge, but rather extend, our facilities for obtaining full statistics upon the points last enumerated, I would deem it a subject worthy of grave consideration, whether we might not devise some more direct and appro-

priate method of arriving at these desirable results. In the best European systems, the personal census is made a distinct and independent branch of inquiry, and in our own country it will generally be found that this portion has received the most attention, as if it had been regarded the primary object, while the remaining inquiries had been considered as incidentally, and more or less remotely, connected with it.

As we multiply inquiries upon collateral subjects, we necessarily extend the time required by each enumerator for the performance of his duties, and consequently admit into every department, the errors incident to changes and removals, by which the proper persons cannot be found to answer the questions required. Lapse of time will also impair the memory of many persons, and the precision of the returns will be found invariably to bear an inverse ratio to the interval within which the enumeration is made. The nearer we approach a point of time, the greater will be the chances of success, and not until the census is taken upon one day, can we hope to secure everything desirable in point of accuracy.

Another source of error will be found in the want of a uniform knowledge of their duties by the census marshals, or a misconstruction of the intention of the several columns of the schedules. This error is always more liable to occur in the collateral inquiries, than in those relating to the population. Two persons might, for example, report a very unequal amount of improved and unimproved land in the same district, by one including and the other rejecting from the column of improved land, a natural meadow or marsh, which was partly available for tillage. This liability to error can only be remedied by very minute and carefully prepared instructions, fully indexed and conveniently arranged for reference. In many instances, the persons charged with taking the census might be previously convened, the plan and intentions of the schedules explained by some person thoroughly informed, their principles discussed and questions upon doubtful points answered. I consider this measure fully

applicable to a State census, and should not hesitate to urge its adoption, whenever sufficient numbers of the enumerators could be assembled. A single evening, thus spent in mutual discussion, would do much towards preparing these officers for an intelligent and uniform discharge of their duties, and enable them to commence their labors, with a fuller appreciation of the subject than they might, under other circumstances, end them. From the short period devoted to obtaining the census, a person has no chance of acquiring that facility for the transaction of the business that grows out of long experience and habitual application, as we constantly see in other pursuits of life;—and from the long interval that occurs between two enumerations, it can scarcely be expected that the experience acquired upon one census will be to any extent available in the next. We must therefore depend upon preliminary instruction, of the kind above alluded to, for anything we have to expect, beyond the ordinary sagacity and intelligence of the officers charged with the duty of collecting these statistics.

It is not probable that the census marshals will generally inform themselves of the varied deductions which may arise from their labors, or even that those who have given the subject the careful study of years, can fully realize the beautiful generalizations that may grow out of these facts, when they shall have accumulated through a long series of years; for when the tables of a census lose their interests as charts of existing society, they become pages of history and landmarks of progress.

Yours, respectfully,

FRANKLIN B. HOUGH.

ALBANY, Feb. 17, 1859.

RAIN-BASINS OF PENNSYLVANIA.

	Basins.	Sq. M.	Sq. M.
Atlantic.	Delaware River	3,895	6,499
	Schuylkill	1,884	
	Brandywine	720	
	Susquehanna River	17,018	20,446
	Juniata	3,428	
	Potomac River	1,581	1,581
Gulf of Mexico.	Ohio River—		
	Alleghany	9,546	15,432
	Monongahela	2,800	
	Beaver	3,086	
St. Lawrence.	Lake Erie	352	352
	Lake Ontario (Genesee) ..	90	90
Total		44,400	44,400

STATISTICS OF AMERICAN STATES.

NO. 3.

REPUBLIC OF BUENOS-AYRES.

Lat. 33° 19' to 41° 12' S. | Population (1855,) 303,355.
Long. 56° 13' to 70° 57' W. | Density, 1.03 to sq. mile.
Area, 294,000 sq. miles. | Capital, BUENOS-AYRES.

GOVERNMENT.

Executive.—Governor and Captain-General, elected for three years.

Administration.—1. Minister of the Interior and foreign affairs; 2. Minister of War and Marine; and, 3. Minister of Finance.

Legislature.—A Senate and Chamber of Deputies. Assembles annually.

Judiciary.—A Supreme Court of Appeals, 3 District Courts, &c.

National Religion.—The Holy Apostolic Roman Catholic. The Church is under the immediate superintendence of the Bishop of Buenos-Ayres.

POPULATION, (1856.)

Northern District	53,344
Western "	66,134
Southern "	82,877

Total rural population	202,355
City of Buenos Ayres	101,000

Total civic and rural population .. 303,355

NATIONAL FORCES.

Army, (on the peace establishment.)—Infantry, cavalry and artillery, 6,370 men.

National Guard.—About 30,000 men.

Navy.—3 steamers, 2 corvettes, and 4 other small vessels.

PUBLIC FINANCE.

Revenue—Receipts (1857) .. 82,105,211 pesos.
viz., Import duties .. 60,487,896

Export duties .. 9,525,053

Direct taxes .. 2,653,908

Other sources .. 9,438,354

--Expenditures (1857) .. 79,800,392 pesos.

Public Debt—Interior (bearing interest) .. 18,500,000
Paper in circulation .. 105,000,000

Total (in paper money) .. 123,500,000

" — Foreign .. £1,750,000 sterling.
(20 paper—1 silver.)

LIVE STOCK IN THE STATE, (1856.)

Cattle	4,502,090 head.
Horses	2,196,663 "
Sheep	7,966,725 "

COMMERCE.

1.—Value of Exports and Imports, (1855.)

Exports.	Imports.
Great Britain..\$3,239,453	Great Britain..\$4,860,000
United States.. 3,244,844	France..... 2,700,000
France..... 2,181,862	N. of Europe... 918,000
Belgium..... 1,810,716	Spain, Gibraltar
Spain..... 1,358,131	and the Med-
Havanna..... 828,385	iterranean... 648,000
Italy..... 987,152	United States.. 1,080,000
Brazil..... 925,060	Brazil, &c..... 1,188,000
Chile..... 293,524	
Hamburg..... 223,707	
Netherlands... 115,239	
Other countries. 52,913	

Total...\$15,260,986 Total...\$11,394,000

2.—Quantity and Value of Exports, (1855.)

Ox and Cow Hides.....No.	1,198,573	\$7,465,449
Horse Hides....." "	148,740	192,439
Goat and Sheep Skins...dos.	161,250	461,683
Hair.....qtls.	33,832	730,771
Wool....." "	225,773	2,302,885
Grease and oil....." "	57,216	305,266
Tallow....." "	122,764	1,522,274
Salt meats....." "	258,860	1,397,844
Tobacco....." "	28,189	422,835
Ostrich feathers.....lbs.	129,599	41,471

3.—Exports of Hides for 7 Years.

Years.	Ox and Cow Hides.	Horse Hides.
1849.....	2,961,342	238,514
1850.....	2,424,251	187,107
1851.....	2,601,318	140,677
1852.....	1,994,196	106,047
1853.....	1,205,252	133,660
1854.....	1,399,353	246,273
1855.....	1,198,573	148,740

4.—Navigation, (1855.)

Arrivals.....	619 vessels.	153,119 tons.
Departures.....	592 "	144,051 "

5.—Commerce with United States.

(From U. S. "Com. and Nav. Tables," 1846-55.)

	Exports from U. S.	Imports into U. S.
1846.....	\$185,425	\$799,213
1847.....	176,089	241,209
1848.....	233,928	1,026,097
1849.....	767,594	1,709,827
1850.....	1,064,643	2,653,877
1851.....	1,074,768	3,265,382
1852.....	799,117	2,091,097
1853.....	881,466	2,186,641
1854.....	761,725	2,144,971
1855.....	969,427	2,545,087

WEIGHTS AND MEASURES.

Old denominations.—Spanish.

New denominations.—French.

MONEY.

The currency of Buenos Ayres is a debased paper money, the dollar of which is worth about 5 cents, but fluctuates.

OCCUPATIONS OF CHILE.

A census of Chile, taken in 1857, gave to that republic a population of 1,558,319 souls, including about 25,000 foreigners. The occupations of 439,582—males 231,105, and females 208,477—are given, and may be classified as follows:

	Males.	Females.	Total.
Merchants.....	11,150	203	11,353
Farmers.....	10,749	1,019	11,768
Shoemakers.....	10,412	797	11,209
Carpenters.....	9,449	...	9,449
Bricklayers.....	2,875	...	2,875
Spinners.....	157	60,193	60,350
Weavers.....	204	24,891	25,095
Blacksmiths.....	2,606	...	2,606
Tailors.....	3,433	6	3,439
Seamen.....	1,820	...	1,820
Military.....	3,868	...	3,868
Miners.....	17,430	218	17,648
Surveyors.....	47	...	47
Civil Engineers.....	77	...	77
Lawyers.....	282	...	282
Laborers.....	9,111	...	9,111
Day laborers.....	124,561	226	124,787
Washerwomen.....	9 (?)	19,952	19,961
Servants.....	13,644	16,820	30,464
Cooks.....	640	20,634	21,274
Sewing women.....	16 (?)	63,518	63,534
Mule drivers.....	8,565	...	8,565

In 1855 the total population amounted 1,439,120, of which number 712,932 were males, and 726,188 were females.

CALIFORNIA GOLD.

The following table exhibits the sums total exported from California since the first discovery of gold in that State:

Years.	Value.	Remarks.
1848.....	...	No official statement.
1849.....	\$4,921,250	Statement defective.
1850.....	27,676,346	" "
1851.....	34,492,007	" complete.
1852.....	45,779,803	" "
1853.....	54,965,010	" "
1854.....	52,429,098	" "
1855.....	45,182,631	" "
1856.....	50,697,434	" "
1857.....	48,976,697	" "
1858.....	47,584,025	" "

These sums added together, make a total of \$411,704,301; but to obtain the whole amount of the actual product, a large supplement, say 33½ per centum, must be added, covering the amounts carried away by passengers and not manifested, and the amounts retained in the State for current use, etc. With this addition, the sum total would be \$549,605,735, or since 1848, in round numbers \$550,000,000, or about \$55,000,000 per annum.

The following statement exhibits the value and places of destination of the gold shipped

from San Francisco for three years, ending 31st December, 1858:

	1858.	1857.	1856.
To New York....	\$35,578,236	\$35,287,778	\$39,765,294
England.....	9,285,739	9,347,748	8,666,289
New Orleans..	313,000	244,000	130,000
Panama.....	299,265	410,929	253,268
China.....	1,916,007	2,993,264	1,303,852
Sandwich Is'ls	96,672	86,803	241,450
Manilla.....	49,975	278,920	133,265
Australia.....	631	32,000	56,518
Mexico.....	14,500	41,500	.....
Chile.....	11,500	33,479	11,398
Society Islands	2,000	.....	5,300
Vancouver "	500	.....	.....
Other parts ..	.....	220,296	125,800

Total.....\$47,548,025 \$48,976,697 \$50,697,434

The amount of California gold deposited at the United States mint and branches to the close of the year ending 30th June, 1858, has been as follows:

	U. S. Mint at Philadelphia.	Branch Mint at San Francisco.	Branch Mint at New Orleans.	Branch Mint at Charlotte.	Branch Mint at Baltimore.	Branch Assay Office at New York.
1858.....	\$44,177	.....	.....	.....	.....	.....
1857.....	5,481,431	.....	.....	.....	.....	.....
1856.....	31,667,505	.....	.....	.....	.....	.....
1855.....	49,938,367	.....	.....	.....	.....	.....
1854.....	49,663,623	.....	.....	.....	.....	.....
1853.....	62,732,227	.....	.....	.....	.....	.....
1852.....	36,671,185	.....	.....	.....	.....	.....
1851.....	2,634,297	.....	.....	.....	.....	.....
1850.....	1,440,134	.....	.....	.....	.....	.....
1849.....	666,666	.....	.....	.....	.....	.....
1848.....	1,372,606	.....	.....	.....	.....	.....
Total.....	\$228,212,027	\$92,543,133	\$22,064,901	\$87,321	\$1,230,006	\$80,336,860

—making a grand total of \$424,464,240. During the same term of years, the amount of silver parted from the gold at all the mints was \$3,001,577.

IMMIGRATION INTO THE UNITED STATES.

In compliance with the act of Congress of 3d March, 1855, the Secretary of State has transmitted to that body a statement of the number, sex, age and occupations of passengers arriving by sea from foreign countries, during the year ending 31st December, 1858; together with the country in which they were born, the country of their intended residence, and the number that died on the passage. From this paper we abstract the following interesting details of the movement:

1.—ARRIVAL OF PASSENGERS IN 1858.

Places.	Males.	Fem's.	Sex not stated.	Total.
Portland, Me.....	490	188	9	687
Passamaquoddy, Me.....	367	98	..	465
Portsmouth, N. H.....	17	19	..	36
Boston, Mass.....	5,635	3,712	..	9,347
Edgartown, Mass.....	27	11	..	38
Fall River, Mass.....	4	9	..	13
New Bedford, Mass.....	104	26	..	130
Bristol and Warren, R. I ..	3	..	..	3
Providence, R. I.....	27	31	..	58
New York city, N. Y.....	62,243	39,399	..	101,642
Oswego, N. Y.....	828	264	..	1,092
Detroit, Mich.....	1,594	1,466	..	3,060
Philadelphia, Penn.....	1,270	1,321	..	2,591
Baltimore, Md.....	2,101	1,885	..	3,986
Newbern, N. C.....	2	1	..	3
Charleston, S. C.....	753	271	..	1,024
Key West, Fla.....	438	87	..	525
Mobile, Ala.....	65	31	..	96
New Orleans, La.....	8,091	5,157	291	13,539
Galveston, Texas.....	275	222	..	497
La Salle, Texas.....	16	17	..	33
San Francisco, Cal.....	5,298	499	..	5,797
Total.....	89,648	54,704	300	144,652

2.—DIED ON THE PASSAGE

To	Males.	Females.	Total.
Boston.....	4	3	7
New York city.....	106	94	200
Philadelphia.....	3	1	4
Baltimore.....	3	3	6
New Orleans.....	22	15	37
Total.....	138	116	254

3.—AGES OF PASSENGERS ARRIVED.

Age.	Males.	Females.	Total.
Under 5 years of age.....	5,219	6,134	10,353
Between 5 years of age and 10.....	4,451	3,935	8,186
" 10 ".....	3,916	3,459	7,375
" 15 ".....	12,296	11,036	23,332
" 20 ".....	18,273	11,265	29,538
" 25 ".....	17,801	7,570	25,371
" 30 ".....	9,952	3,833	13,785
" 35 ".....	7,652	3,243	10,895
40 years of age and upward.....	10,277	5,268	15,545
Age not stated.....	149	77	526
Age nor sex stated.....	.....	.....	300
Total.....	89,786	54,620	144,906

4.—COUNTRY IN WHICH BORN.			
Countries.	Males.	Fem's.	Sex not stated. Total.
England	9,092	5,546	14,638
Ireland	14,299	12,574	26,873
Scotland	1,134	812	1,946
Wales	189	127	316
Great Britain	6,798	5,258	12,056
British America	2,908	1,695	4,603
Portugal	109	68	177
Spain	1,108	174	1,282
France	2,134	1,021	3,155
Italy	689	200	889
Germany	23,901	18,390	42,291
Turkey	16	1	17
Sicily	59	35	94
Sardinia	167	90	257
Holland	128	57	185
Prussia	1,705	1,314	3,019
Belgium	118	66	184
Denmark	136	96	232
Norway and Sweden	1,293	1,137	2,430
Poland	6	3	9
Russia	135	111	246
Switzerland	653	403	1,056
Mexico	286	143	429
West Indies	518	129	647
South America	89	42	131
Central America	8	3	11
China	4,808	320	5,128
Australia	28	4	32
East Indies	2	3	5
Sandwich Islands	4	..	4
Cape Verde Islands	2	..	2
Madeira Islands	5	7	12
Asores	193	96	289
Malta	2	..	2
Africa	10	7	17
United States	16,962	4,818	21,780
Not stated	92	70	300
Total	89,786	54,820	144,606
Born in the United States	16,962	4,818	21,780
Aliens	72,824	50,002	122,826

5.—OCCUPATIONS OF PASSENGERS ARRIVED.

	Males.	Females.	Total.
Merchants	10,217	..	10,217
Mechanics	11,995	..	11,995
Mariners	1,109	..	1,109
Miners	4,254	..	4,254
Engineers	165	..	165
Clergymen	132	..	132
Farmers	20,506	..	20,506
Clerks	259	..	259
Butchers	38	..	38
Bakers	74	..	74
Physicians	178	..	178
Lawyers	113	..	113
Masons	68	..	68
Manufacturers	74	..	74
Artists	44	1	45
Laborers	22,317	..	22,317
Millers	39	..	39
Tailors	156	..	156
Seamstresses and milliners .....	..	261	261
Weavers and spinners	40	40	80
Painters	31	..	31

OCCUPATIONS OF PASSENGERS—CONTINUED.			
Shoemakers	117	..	117
Musicians	84	31	115
Teachers	45	1	46
Printers	19	..	19
Actors and actresses	27	6	33
Hatters	3	..	3
Servants	53	1,089	1,142
Other occupations	446	5	451
Occupation not stated	17,183	53,386	70,569
Occupation nor sex stated .....	..	..	300
Total	89,786	54,820	144,606

6.—TOTAL ARRIVALS, DEATHS AND EMBARKATIONS, ETC.

	Sex not stated.		Total.
	Males.	Fem's.	
Arrivals in the United States	89,648	54,704	144,352
Died on the voyage	138	116	254

Total number embarking at foreign ports for the United States during the year

1858	89,786	54,820	300	144,906
In transit	2,747	1,248	..	3,995

Net gain to U. S. 87,039 53,572 300 140,911

7.—PROGRESS OF IMMIGRATION.

A.—Arrivals from 1790 to 1843.

Years.	Arrivals.	Years.	Arrivals.
1790 to 1800	50,000	1830-31	23,074
1800 to 1810	70,000	1831-32	45,278
1810 to 1820	114,000	1832-33	56,547
1820-21	5,993	1833-34	65,335
1821-22	7,329	1834-35	52,899
1822-23	6,749	1835-36	62,473
1823-24	7,088	1836-37	78,083
1824-25	8,532	1837-38	59,363
1825-26	10,161	1838-39	52,163
1826-27	12,418	1839-40	84,146
1827-28	26,114	1840-41	83,504
1828-29	24,459	1841-42	101,107
1829-30	27,153	1842-43	75,159
Total 1790-1843	1,209,126		

B.—Arrivals from 1843 to 1858.

Years ending.	No. of Males.	No. of Females.	Sex not stated.	Total.
30 Sept. 1844	48,897	35,867	..	84,764
" 1845	69,179	49,311	1,406	119,896
" 1846	90,974	66,778	897	158,649
" 1847	139,167	99,353	990	239,482
" 1848	136,128	92,883	472	229,483
" 1849	179,256	119,915	512	299,683
" 1850	200,904	113,392	1,038	315,234
3 months 1850	38,282	27,107	181	65,570
31 Dec. 1851	245,017	163,745	66	408,828
" 1852	235,731	160,174	1,438	397,343
" 1853	236,732	164,178	72	400,982
" 1854	284,887	175,587	..	460,474
" 1855	140,181	90,283	12	230,476
" 1856	135,308	89,188	..	224,496
" 1857	162,538	109,020	..	271,558
" 1858	89,648	54,704	300	144,652
Total	2,432,829	1,611,457	7,384	4,051,670
Tot. f'm 1790 to '43	1,209,126			

GRAND TOTAL from 1790 to 1858 5,260,796

8.—ORIGIN OF IMMIGRANTS, 1820-1850.

(Exclusive of Americans returned from abroad.)				
Countries.	1820 to 1835.	1836 to 1850.	Total 1820 to 1850.	In U. S. Census of 1850.
England....	21,595	33,945	55,540	278,675
Wales.....	347	1,269	1,616	29,868
Scotland...	5,658	3,901	9,559	70,555
Ireland....	50,304	168,322	218,626	961,719
Not stated..	108,362	1,019,078	1,127,440	.....
U. Kingdom..	186,266	1,226,515	1,412,781	1,340,812
France.....	26,638	105,076	131,714	54,069
Spain.....	3,565	43,385	6,950	3,113
Portugal....	891	668	1,559	1,274
Belgium....	33	5,091	5,124	1,313
Prussia.....	433	16,092	16,525	10,549
Germany....	52,868	525,396	578,264	574,171
Holland....	1,757	9,036	10,790	9,848
Denmark....	467	1,324	1,791	1,838
Swed. & Nor..	509	14,689	15,198	16,237
Poland.....	164	331	495	See Russia.
Russia.....	325	592	917	1,414
Turkey.....	23	64	87	106
Switzerland..	6,020	6,702	12,722	13,358
Greece.....	29	56	85	86
Italy & Malta..	2,339	2,336	4,675	2,679
Other Coun- tries of Continental Europe....	2	51	53	....
Total Conti't.	96,063	690,886	786,949	691,055
B. America..	6,677	51,156	57,833	147,711
S. America..	1,004	3,973	4,977	1,543
Cent'l Amer..	147	372	519	141
Mexico.....	9,033	5,655	14,688	13,317
West Indies..	9,528	20,299	29,827	3,772
Tot. Amer..	26,389	81,455	107,844	168,484
Asia.....	46	99	145	1,135
Africa and Oceanica..	546	500	1,046	1,139
All other....	...	...	...	8,214
Tot. Asia etc..	592	599	1,191	10,488

Recapitulation, 1820-1850.

U. King'm..	186,266	1,226,515	1,412,781	1,340,812
Continent..	96,063	690,886	786,949	691,055
Europe ..	282,329	1,917,401	2,199,730	2,031,867
America ...	26,389	81,455	107,844	168,484
Asia, etc ...	592	599	1,191	10,488
Grand Total.	309,310	1,999,455	2,308,765	2,210,839

The total immigration of aliens to the end of 1858 has been:

Countries.	1820 to 1850.	1851 to 1858.	1820 to 1858.
England.....	55,540	220,298	275,838
Wales.....	1,616	5,377	6,993
Scotland.....	9,559	34,425	43,984
Ireland.....	218,626	664,887	883,513
Unclassed.....	1,127,440	273,353	1,400,793
United Kingdom.	1,412,781	1,198,340	2,611,121

TABLE OF IMMIGRATION—CONTINUED.

France	131,714	63,818	195,532
Spain	6,950	6,983	13,933
Portugal	1,559	887	2,446
Belgium	5,124	4,664	9,788
Prussia.....	16,525	37,673	54,198
Germany.....	578,264	817,619	1,395,883
Holland.....	10,790	10,148	20,938
Denmark	1,791	2,708	4,499
Sweden and Norway..	15,198	19,562	34,760
Poland.....	495	976	1,471
Russia.....	917	301	1,218
Turkey.....	87	69	156
Switzerland.....	12,722	23,265	35,987
Greece.....	85	29	114
Italy and Malta.....	4,675	7,284	11,959
Other Countries	53	...	53
Continental Europe..	786,949	995,986	1,782,935
British America.....	57,833	50,632	108,465
South America.....	4,977	861	5,838
Central America.....	519	437	956
Mexico.....	14,688	2,584	17,272
West Indies	29,827	6,397	38,224
America.....	107,844	62,911	170,755
Asia.....	145	32,518	32,663
Africa and Oceanica..	1,046	2,516	3,562
All other Countries..	...	22,234	22,234

Grand Total.. 2,308,765 2,314,505 4,623,270

The above statement shows the number of persons of foreign birth, living in the United States in 1850, to be 2,210,839, and that the whole number of arrivals for a period of 30 years, prior to that date, to be 2,308,767. As it is by no means probable that only 97,528 deaths had occurred in this number in the meantime, there must, consequently, be some error, either in the census or in the records of the arrivals. It is altogether probable that the error is to be looked for in the census, as it is scarcely possible that there should be any considerable error in the number of passengers arriving, as the captain of each vessel is, by law, required to furnish a list of passengers, all of whom of foreign birth are subject to a capitation fee.

COMMERCE OF PORTO RICO.

The following statement for 1856 and 1857 are from official returns:

	1856.	1857.
Value of Imports	\$6,571,159	\$7,999,006
" of Exports.....	5,371,804	4,429,349
Vessels arrived—No.....	1,375	1,454
Tonnage of vessels—tons...	184,526	176,921
Duties on exports and imports.	\$1,125,743	\$1,251,444
" on tonnage.....	126,446	109,836

MERCANTILE FAILURES IN THE UNITED STATES IN 1857-'58.

	No. of fail's in 1857.	Total am't of liabil's, '57.		No. of fail's in 1858.	Total am't of liabil's, '58.
<i>New York</i> —New York City, (in- cluding B'klyn & W'msburg..	915	\$135,129,000	<i>New York</i> —New York City (in- cluding B'klyn & W'msburg..	406	17,773,462
Albany.....	35	838,000	Albany.....	22	345,708
Buffalo.....	72	4,224,000	Buffalo.....	36	599,940
Oswego.....	13	161,000	Oswego.....	8	73,600
Rochester.....	31	850,000	Rochester.....	15	345,000
Syracuse.....	29	436,000	Syracuse.....	19	408,600
Troy.....	24	1,607,000	Troy.....	10	278,570
Utica.....	20	585,000	Utica.....	10	212,220
Balance of the State.....	447	6,789,000	Balance of the State.....	340	4,315,620
<i>Pennsylvania</i> —Philadelphia...	280	32,954,000	<i>Pennsylvania</i> —Philadelphia...	109	10,002,385
Pittsburgh.....	28	1,183,000	Pittsburgh.....	22	610,742
Balance of the State.....	226	2,283,000	Balance of the State.....	232	4,647,656
<i>Ohio</i> —Cincinnati.....	96	3,898,000	<i>Ohio</i> —Cincinnati.....	51	1,345,533
Cleveland.....	30	613,000	Cleveland.....	17	255,000
Balance of the State.....	229	2,357,000	Balance of the State.....	214	1,672,838
<i>Indiana</i>	139	1,636,000	<i>Indiana</i>	127	1,154,684
<i>Michigan</i> —Detroit.....	34	1,514,000	<i>Michigan</i> —Detroit.....	27	1,047,924
Balance of the State.....	98	1,004,000	Balance of the State.....	120	1,731,480
<i>Illinois</i> —Chicago.....	117	6,572,000	<i>Illinois</i> —Chicago.....	87	3,590,664
Balance of the State.....	199	2,766,000	Balance of the State.....	305	4,978,210
<i>Iowa</i> —Dubuque.....	36	735,000	<i>Iowa</i> —Dubuque.....	26	825,058
Balance of the State.....	108	1,333,000	Balance of the State.....	94	2,196,122
<i>Wisconsin</i> —Milwaukee.....	19	380,000	<i>Wisconsin</i> —Milwaukee.....	21	314,475
Balance of the State.....	101	1,244,000	Balance of the State.....	137	2,435,723
<i>Minnesota and Territories</i>	63	1,705,000	<i>Minnesota and Territories</i>	90	1,355,840
<i>Delaware & Dist. of Columbia</i>	20	261,000	<i>Delaware & Dist. of Columbia</i>	46	277,150
<i>Massachusetts</i> —Boston.....	253	41,010,000	<i>Massachusetts</i> —Boston.....	123	4,178,925
Balance of the State.....	230	2,611,000	Balance of the State.....	128	3,937,792
<i>Rhode Island</i> —Providence.....	35	4,564,000	<i>Rhode Island</i> —Providence.....	17	274,000
Balance of the State.....	4	105,000	Balance of the State.....	13	273,923
<i>Connecticut</i>	61	1,129,000	<i>Connecticut</i>	89	2,213,430
<i>Maine</i>	81	1,060,000	<i>Maine</i>	61	646,051
<i>New Hampshire</i>	70	928,000	<i>New Hampshire</i>	37	403,152
<i>Vermont</i>	57	473,000	<i>Vermont</i>	40	278,720
<i>New Jersey</i>	86	1,142,000	<i>New Jersey</i>	60	775,800
<i>Louisiana</i> —New Orleans.....	58	6,285,000	<i>Louisiana</i> —New Orleans.....	45	3,465,000
Balance of the State.....	5	246,000	Balance of the State.....	13	341,900
<i>Missouri</i> —St. Louis.....	49	5,522,000	<i>Missouri</i> —St. Louis.....	22	782,980
Balance of the State.....	29	433,000	Balance of the State.....	29	609,000
<i>Maryland</i> —Baltimore.....	58	3,206,000	<i>Maryland</i> —Baltimore.....	76	2,442,640
Balance of the State.....	41	725,000	Balance of the State.....	92	520,996
<i>Kentucky</i> —Louisville.....	19	757,000	<i>Kentucky</i> —Louisville.....	18	555,462
Balance of the State.....	31	1,007,000	Balance of the State.....	62	682,000
<i>Virginia</i> —Richmond.....	30	781,000	<i>Virginia</i> —Richmond.....	25	499,125
Balance of the State.....	90	982,000	Balance of the State.....	244	2,183,800
<i>Georgia</i>	32	925,000	<i>Georgia</i>	71	1,415,243
<i>Arkansas</i>	7	309,000	<i>Arkansas</i>	17	739,600
<i>Alabama</i>	16	295,000	<i>Alabama</i>	48	2,038,752
<i>Mississippi</i>	11	445,000	<i>Mississippi</i>	36	1,053,000
<i>Tennessee</i>	40	712,000	<i>Tennessee</i>	103	1,597,015
<i>Texas</i>	15	393,000	<i>Texas</i>	28	467,432
<i>North Carolina</i>	62	1,171,000	<i>North Carolina</i>	90	1,499,400
<i>South Carolina</i> —Charleston...	31	922,000	<i>South Carolina</i> —Charleston...	20	578,180
Balance of the State.....	24	305,000	Balance of the State.....	21	249,900
<i>Florida</i>	7	250,000	<i>Florida</i>	6	142,440
Total United States.....	4932	\$291,750,000	Total United States.....	4225	\$95,749,662
<i>Canada West</i> —Toronto.....	25	2,714,000	<i>Canada West</i> —Toronto.....	16	383,376
Balance of Canada West.....	109	2,172,000	Balance of Canada West.....	211	1,305,879
<i>Canada East</i> —Montreal.....	15	523,000	<i>Canada East</i> —Montreal.....	40	1,110,040
Balance of Canada East.....	15	1,267,000	Balance of Canada East.....	22	616,770
<i>Nova Scotia and New Brunswick</i>	22	1,375,000	<i>Nova Scotia and New Brunswick</i>	23	1,021,844
Total U. S. and Br. Provinces. 5118		\$299,801,000	Total U. S. and Br. Provinces. 4537		\$100,187,571

COINS OF JAPAN.

Messrs. J. R. Eckfeldt and W. E. Dubois, in a letter dated 5th Feb., 1859, and addressed to the Hon. J. R. Snowdon, Director of the U. S. Mint, &c., have given an elaborate description of the coins of Japan, their contents, value, &c. At this moment, when public attention is much drawn to the subject of our intercourse with this unique nation, such a communication from official sources is timely and acceptable. They say:

"The series of Japanese coin consists of three sizes of gold, two of silver, and three of an alloy of inferior metal. In their shape, composition and relation to each other, they present some striking features, which set them apart from every other system of coinage in the world.

"The principal gold coin, known as the *cobang* or *cobank*, is of an oval shape, about two and a half inches long, and half as wide. It is very thin, soft and easily bent, having no elasticity; its appearance is that of fine gold, and its surface is marked by sundry figures not well understood as yet, although it is said that the flowery ornaments are 'the arms of the spiritual Emperor,' and that a certain central cypher is the special imprint of the 'Inspector-general of money.' The weight, two specimens agreeing, is 362 thousandths of an ounce, or nearly 174 grains. Next is a gold piece of one-fourth that weight, and intended as a quarter of the preceding, called the 'gold *itzebu*;' but its form is entirely different. It is four sided, rectangular, and very thick, three-fourths of an inch long, and half that in width. The smallest gold coin is the half *itzebu*, of proportional size. We have then the silver *itzebu*, and its quarter, of the same domino shape; the larger piece weighing 280 thousandths of an ounce, or 134½ grains. Passing to the third division, there is the 'hundred p'senny,' a casting of red brass, oval and thick, measuring two inches long, and a little more than half as wide, with a hole in the centre. Finally, there are pieces of four, and one p'senny, circular, with holes in the centre, and scarcely to be distinguished from the well-known Chinese cash.

"The composition of these coins, a subject falling within our particular province, has been to some extent examined. The *cobang* and *itzebu*, as was observed, have the appearance of fine gold, and, it is said, are regarded at home as being of high quality. But it is only necessary to scratch away the surface to discover

that the Japanese understand the process of pickling, well known to workers in jewelry, whether in America or Asia, or even in the centre of Africa. Trusting to the somewhat permanent effects of 'hard biting,' they have not even added copper to mitigate the whitening effect of silver alloy; the mixture being gold and silver, and not far from equal proportions. The *cobang*, two pieces assayed, gave 567½ and 568½ thousandths fine; the *itzebu* resulted 566. These figures indicate a designed, though probably a secret, standard. The consequent intrinsic values are, according to our mint rates, and allowing for silver contained, \$4 44 for the *cobang*, and \$1 11 (nearly) for the *itzebu*.

"It is interesting to observe that, although so ignorant of the methods of other nations, Japan has imitated, and even exceeded them, in the process of deteriorating money. About the beginning of the last century the *cobang*—quite similar in shape and device to the present piece—weighed 272 grains, was 854 fine, and worth just ten dollars. A century later it had fallen to 196 grains, 667 fine, and worth (including silver) five dollars and seventy-eight cents.

"The smallest gold coin has not been assayed; it evidently contains but little gold, and has therefore a forced valuation. The transition to the next piece in order, the largest silver coin, affords a fresh surprise. It is found to be of almost absolute fineness—that is, 991 thousandths—and is worth 37 cents. While this proves that the Japanese possess the art of refining, it does not explain why they debase the gold, and refine the silver. The smallest silver piece is apparently not inferior in fineness.

"The foregoing details will be interesting to the numismatist and metallurgist, but the fact which remains will excite a more popular attention. It is in regard to the legal relation which these coins bear to each other. Insulated from the rest of mankind, the Japanese have proportioned gold to silver according to their own ideas of use and state of supply. The gold and silver *itzebu* are, as is stated, interchangeable; that is, a piece which is worth in our eyes 111 cents (and to a Japanese worth nearly as much as two of our gold dollars, because he supposes it to be much better gold than it is,) buys no more than a piece which, with us, would be 37 cents. The Spanish or Mexican dollar they consider equal to three *itzebus*; which is three-fourths of a *cobang*, or \$3.33. The abundance of gold, or the scarcity of silver, which creates such a strange ratio, would no doubt be promptly corrected by foreign traders for the sake of the enormous profit. But, unfortunately, there

is a stringent law against the exportation of coin, which makes it very difficult even to get a few pieces for assay. For our facilities in this respect we are indebted to the perseverance of a gentleman who is interested in the collection of rare coins, and to his correspondent abroad.

"What relation the oval piece of brass, which passes for 'one hundred' bears to the itzebu, we are not informed. It weighs only about six times as much as the piece of one p'senny, and therefore bears an arbitrary value; unless brass is there held to be vastly more valuable than an alloy of copper and lead, which appears to be the composition of the coin which stands at the bottom of the scale."

ERRATA.

In the 10th and 11th lines from the bottom of the 47th page of the last number of the JOURNAL, in the column of figures under the head "feet above tide," substitute 2,100 for 1,100, and 1,970 for 2,970.

DEPARTMENT OF PUBLICATIONS.

BOOKS, MAPS AND CHARTS, ETC., *Purchased or donated since last Report.*

Acknowledgements of all donations to the Library will be made in the number of the JOURNAL, issued next after they have been received and entered.

The friends of the Society, and all desirous of facilitating the study of Geography and Statistics, are respectfully urged to send to the Library Rooms (Clinton Hall, Astor Place,) donations of books, atlases, maps and charts, whether ancient or modern, connected with these pursuits.

It is also important that the Society should possess a complete collection of all existing text-books in Geography, and its cognate sciences; and the publishers of such works are requested to send copies thereof, so as to create a department of the Library for the special use and reference of teachers and others interested in educational matters.

SOUTH AMERICA—(*Presented by Henry V. Poor, Esq.*)

—Valley of the Amazon and the Atlantic Slopes. By M. F. Maury, L.L.D. Washington, 1853. 8vo., pp. 64.

—Explanation of a project for navigating the Magdalena River by steam. By John May. New York, 1855. 8vo.

BALTIMORE—(*Presented by Henry V. Poor, Esq.*)

—Baltimore as it is. By John C. Gobright, 1857. 1 vol., 12 mo., pp. 185.

BOSTON—(*Presented by Henry V. Poor, Esq.*)

—Report of the Receipts and Expenditures of Boston 1856-7. 1 vol., pp. 294.

MISCELLANEOUS—(*Presented by H. V. Poor, Esq.*)

—Railway and Commercial Information. By Samuel Salt. London, 1850. 1 vol., 12 mo. pp. 240.

—Manufacture of Ice on a Commercial Scale, etc. New Haven, 1857. 8vo., pp. 24.

—Rules and Regulations for Proceedings in Patent Office, Washington. 8vo., pp. 24.

ATMOSPHERIC MOVEMENTS—(*Presented by the Author through the New York State Librarian.*)

—Essai sur les ouragans et les tempestes; et prescriptions nautiques pour en souffrir le moins de dommages possible. Par M. Lartigue. Paris, 1858. 8vo., pp. 136.

—Exposition du Systeme des vents, ou Traite du Movement de l'air sur la surface du globe, Par M. Lartigue. Paris, 1858. 8vo., pp. 80.

BRITISH BLUE BOOKS—(*Presented by Henry V. Poor, Esq.*)

—Education. London, 1858. 4to., pp. 80.

—Spiritual Instruction and Places of Worship. London, 1858. 4to., pp. 635.

—Bank Acts. London, 1858. 4to., pp. 76.

—Judicial Statistics, 1857. London, 1858. 4to., pp. 140.

—Miscellaneous Statistics. London, 1857. 4to.

—Finance Accounts London, 1858. 4to.

—Accidents on Railways. London, 1853, '54, '55, '56 and '57. 5 vols., 4to.

—Railroad Reports for 1851, '52, '53, '54, '55, '56 and '57. London. 7 vols., 4to.

—Inland Revenue. London, 1858. 8vo., pp. 66.

—Minutes of the Committee of Council on Education. (Financial Report.) London, 1858. 8vo., pp. 852.

—Reports of the Com. of Railways. London, 1848, '49 and '50. London. 4 vols., 4to.

—Poor-Law Commission: Report for 1857. London, 1858. 8vo., pp. 248.

—Reports of the Officers of the Railway Department for 1841, '42, '43, '44 and '45. London. 5 vols., 4to.

GEORGIA—(*Presented by Gov. Joseph E. Brown.*)

—Historical Collections of Georgia. By the Rev. Geo. White. 1 vol., 8vo., pp. 688.

—Annual Report of the Comptroller. 8vo

—Report of the Lunatic Asylum, 1857-58.

—Code of Laws for the government of Franklin College, (Univ. of Georgia) 1854. 8vo.

- Eleventh Annual Report of the President of the South-Western Railroad, 1858. 8vo.
- Treasury Report, 1858. 8vo., pp. 19.
- Deaf and Dumb Asylum: Report for 1858. 8vo., pp. 23.
- Southern Female College: Report for 1858. 8vo., pp. 24.
- Message of Gov. Joseph E. Brown, 1858. 8vo., pp. 32.
- Lunatic Asylum: Report of Trustees, 1856-7.
- Western and Atlantic Railroad: report 1858.
- MINING—(*Presented by Henry V. Poor, Esq.*)
- The Mining Manual and Almanac for 1851, compiled by H. English. London, 1851. 1 vol., 12 mo., pp. 457.
- The Practical Miner's Guide: a treatise on mine-engineering, comprising a set of trigonometrical tables, (Budge's,) etc. New York. G. M. Newton, 1858. 1 vol., 8vo., pp. 192.
- KANAWHA RIVER—(*Presented by the Author.*)
- Report of the Improvement of the Kanawha River, and incidentally of the Ohio by means of artificial lakes. By Charles Ellet, Jr., C. E. Philadelphia, 1858. 8vo., pp. 125.
- ANTIQUARIAN SOCIETY—(*Presented by the Amer. Antiq. Society, Worcester, Mass.*)
- Proceedings of the American Antiquarian Society at the meeting held in Worcester, 21st October, 1858. Boston. 8vo.
- RHODE ISLAND PUBLICATIONS—(*Presented by Hon. John R. Bartlett, Secretary of State.*)
- Butler Hospital for the Insane: Reports for 1856, '57 and '58. 8vo., pp. 28, 34 and 16.
- Treasurer-General's Report for 1858. 8vo.
- Providence Reform School: Reports for 1856, '57 and '58. 8vo., pp. 32 each year.
- Public Schools of Rhode Island. By Henry Barnard. Providence, 1849. 1 vol., 8vo., pp. 560.
- Public Schools: Reports for 1855, '56, '57, and '58. 8vo., pp. 248, 96, 108, and 40.
- Reports of the State Auditor, Feb. 14, 1857 and '58. 8vo., pp. 22 and 16.
- Rhode Island State Prison: Inspectors' Reports for 1853, '54, '55, '56 and '57. 8vo.
- Banks and Savings Institutions: Reports for 1853, '54, '56 and '57. 8vo., pp. about 32.
- Acts relating to the Public Schools of Rhode Island, etc. Providence, 1857. 1 vol., 8vo.
- Narragansett Tribe of Indians: Commissioner's Report for 1858. pp. 8.
- Narragansett Indians: A Communication of Gov. Elisha Dyer, accompanying the Report of the Commissioner. pp. 9.
- Truancy and Absenteeism: Report for 1856.
- Domestic Industry: Transactions of the R. I. Soc. for the Encouragement of. Providence. 1 vol., 8vo., pp. 132.
- Colony of Rhode Island and Providence Plantations: A Census of the Inhabitants of, (in 1774.) Providence, 1858. 1 vol., 8vo., pp. 240.
- Registration Reports (Births, Marriages and Deaths) for 1853, '54, '55, '56 and '57. Providence. 5 vols., 8vo.
- Geological and Agricultural Survey of the State of Rhode Island. Providence, 1840. 1 vol., 8vo., pp. 312.
- UNIVERSAL GEOGRAPHY—(*Presented by Frank Moore, Esq.*)
- Philippi Cluverii Introductionis in Universam Geographiam, tam veterem quam Libri vi Tabulis æneis illustrati. Accessit P. Bertii Breviarum Orbis Terrarum. Amstelodami, ex-officina Elzeviriana, 1672. 1 vol., 48mo., pp. 394.
- OHIO STATE DOCUMENTS—(*Presented by the State of Ohio through W. T. Coggeshall, Esq., State Librarian.*)
- Executive Documents of Ohio. 5 vols., 8vo.
- Senate Journal, 1857 and '58. 3 vols., 8vo.
- Proceedings of the Board of Equalization. 1826-'53. 1 vol., 8vo.
- Ohio Statistics, 1857: Report of the Statistical Bureau. 1 vol., 8vo.
- OHIO AGRICULTURE—(*Presented by the State Board of Agriculture.*)
- Annual Reports of the Ohio State Board of Agriculture for the years 1851, '52, '53, '54, '55, '56 and '57. 7 vols., 8vo.
- CENTRAL AMERICA—(*Presented by the Author.*)
- Map of Central America. By Don Fermin Ferrer. New York, 1859. (Mounted) 48x 36 inches.
- NEW YORK ALMSHOUSES—(*Presented by Washington Smith, Esq.*)
- Annual Reports of the Governors of the Alms Houses. New York, 1851, '52, '53, '54, '55, '56 and '57. 7 vol., 8vo.
- PROSTITUTION—(*Presented by the Author.*)
- History of Prostitution: its extent, causes and effects throughout the world, etc. By William W. Sanger, M. D. New York, 1858. 1 vol., 8vo., pp. 686.
- ROMAN STATES—(*Presented by the Governor-General of the Pontifical States.*)
- Governo Pontificio: Ragguaglio delle cose operate nel ministero del Commercio, Belle Arti, Industria, ed Agricoltura durante l'anno 1856, e per i lavori pubblici nelle anno 1855. Roma, 1857. 4to., pp. 202.
- Regolamento provvisorio di commercio finora vigente nelle provincie di seconda Ricupera e modificato secondo le presscrizioei dell'editto del primo ginguo 1821, etc. Roma, 1821. 8vo., pp. 144.

JOURNAL

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Vol. I.

APRIL, 1859.

No. 4.

PROCEEDINGS.

SEVENTH MEETING, Thursday, March 17, 1859. Archibald Russell, Esq., 2nd Vice President, in the chair.

The following gentlemen were elected members of the Society :

Samuel M. Barlow, William Young, James T. Brady, John R. Brady, Thaddeus Lane, Nathaniel Jarvis, George Lorillard, M. D., William M. Pritchard, Charles A. Rapallo, Sidney Brooks, Edward Bell, Henry S. Sanford, Abraham M. Cozzens, Joseph Blunt, Andrew Boardman, Richard O'Gorman, John D. Burchard, Peter B. Porter, Henry Hilton, A. W. Clason, Alexander T. Stewart, Edward Peltz (of New Jersey), Gulian Verplanck, Charles Gould, Richard S. Willis, George H. Purser, Rev. Sullivan H. Weston, Thos. Ward, William Judson, Henry Clark, John E. Burrell, Jeremiah Laroque, Paschal W. Turney, William Perris, John C. Devereux, Mathew Bird, John D. Chute, Edward P. Beach, John F. Trow, William B. Taylor.

The Hon. John R. Bartlett, (late Superintendent of the Mexican Boundary Commission) Secretary of the State of Rhode Island, and Vice President of the "American Ethnological Society," was elected a "Corresponding Member."

The annual address was then read by the Rev. Joseph P. Thompson, D.D., 3rd Vice President of the Society.

On motion of Marshall Lefferts, Esq., the

thanks of the Society were tendered to the Rev. Dr. Thompson for his address, and a copy thereof requested for the Society's Archives.

Adjourned.

EIGHTH MEETING, Thursday, March 24th, 1859. Archibald Russell, 2d Vice President, in the chair.

John Jay, Esq., read a paper prepared by David Olyphant King, Esq., of Rhode Island, in relation to his "*Visit to, and Explorations and Discoveries in, Siam and Cambodia.*"

The reading of this paper (which was accompanied by a manuscript map of the region explored), was followed by a discussion, in which Mr. Jay, Judge Daly, Mr. Folsom, Mr. Prime and Rev. Dr. Thompson took part.

On motion, a vote of thanks was tendered, to Mr. King for his communication, and the paper ordered to be deposited in the Society's Archives.

Dr. J. C. Hepburn, Dr. D. B. Bradley, now employed in the missionary service in the East, and Townsend Harris, Esq., U. S. Consul in Japan, were proposed, and on suspension of the rules, elected Corresponding Members of the Society.

Mr. Jay read a letter from Lieut. John K. Duer, U. S. Navy, communicating to the Society a series of "Barometric and Thermometric observations at sea, during a voyage from China to the United States by way of Japan,

the Sandwich Islands, and Cape Horn," which, taken in connection with a previous communication, complete a set of observations around the world.

Mr. Jay also read a letter from Gideon Nye, Esq., U. S. Consul at Macao, accompanied by several volumes as a donation to the Society's Library.

The thanks of the Society were voted to Lieut. Duer and Mr. Nye for their contributions, and their correspondence ordered to be deposited in the Society's Archives.

Adjourned.

DEPARTMENT OF GEOGRAPHY.

THE VALUE OF GEOGRAPHY TO THE SCHOLAR, THE MERCHANT, AND THE PHILANTHROPIST.*

MR. PRESIDENT AND GENTLEMEN OF THE AM. GEO. AND STAT. SOCIETY:—

It is a matter of regret to all—and to none more than myself—that at a time when Egypt, South America, and Japan are enlisting the diplomacy and the commerce of Christendom in combined and persistent efforts to render their material and productive resources more available to mankind, that universal scholar who has explored alike the Monuments of Egypt and the Antiquities of Peru, who has given shape to the unwritten legends of this western continent, and who launched Commodore Perry, fresh from the piratical seas of the Great Nippon, upon the more adventurous sea of literature, has chosen to occupy in silence the chair he so much honors, instead of instructing us with his wisdom and animating us by his eloquence.† For myself, in essaying to discourse of geography as a science, in its attractions for literary men, in its benefits to commerce, in its relations to missionary and philanthropic enterprise, I feel oppressed with the magnitude of

the theme. For how can one, whose mind is pre-occupied with the relations of earth to heaven, keep pace with the progress of any purely physical science? And yet, can one who would fitly serve mankind in their higher interests, dispense with the most thorough and minute knowledge of man in his present abode? This science of geography, once regarded as a mere matter of dry but necessary information, is now seen to have vital relations to Man in his physical, mental, social, historical and moral development; so that in seeking to perfect his spiritual life, you cannot separate him from the physical world in which he lives. Indeed, Milton deemed it not unworthy of Michael the Archangel, to give the father of the race a lesson in geography from the map of the world, before unfolding to him the sublime but awful vision of his descendants in their fall:

"It was a hill,
Of Paradise the highest, from whose top
The hemisphere of earth, in clearest ken,
Stretch'd out to th' amplest reach of prospect lay."²

And Homer brings Minerva from the abode of the gods to recall to Ulysses the features of his own country, when restored to it after his wanderings through known and unknown seas.

"Behold the port of Phœreys! fenced around.
Behold where Neritus the clouds divides,
And shakes the waving forests on his sides;
So spake the goddess; and the prospect cleared,
The mists dispersed, and all the coast appeared."[†]

But such has been the progress of our science, that the schoolboy of to-day has a wider field of knowledge open before him in his class-book of geography, than had Minerva upon the island of Ithaca, or Michael from the loftiest summit of middle Asia.

When Dr. Johnson was past seventy years of age, he talked one day with much animation of traveling into distant countries; arguing "that the mind was enlarged by it, and that a certain dignity of character was derived from it. He had then an enthusiastic desire to visit the Wall of China." Boswell, of course, echoed the idea, and said that he himself would go and see the Wall of China, but for the duty of caring for

* The Annual Address delivered March 17th, 1859, by the Rev. Joseph P. Thompson, D.D., Vice President of the Society.

† Rev. Francis Hawks, D.D., L.L.D., author of "Egypt and its Monuments," "Antiquities of Peru," "Narrative of Com. Perry's Expedition," &c.

* Par. Lost, B. XI

† Odyssey, B. XIII.

his children. "Sir," said Johnson, "by doing so, you would do what would be of importance in raising your children to eminence. There would be a luster reflected upon them from your spirit of curiosity. They would be at all times regarded as the children of a man who had gone to view the Wall of China. I am serious, sir."

Now, who would cross the street to see a man who had been to view the Wall of China, much less to see his children? Why, sir, you and I may yet visit the Celestial Empire during the summer recess, when the respected representatives of Oregon and Arizona shall have satisfied us as to the shortest and safest route across the continent. "I, too, am serious, sir."

Already within our life-time, geography has risen to the dignity not only of a science, but of a science among sciences; so that while Milton, in his time, complained that "the writers of geography, though some of them are exact enough in setting down longitudes and latitudes, yet in those other relations of manners, religion, government, and such like, accounted geographical, have for the most part missed their proportions," the age that has produced a Humboldt and a Ritter—the *Koemos* and the *Erkunde*—has learned to comprehend all mundane facts and sciences within the sphere of geography; and foreign accents blending with our own in the unity of race, are teaching us also the organic unity of system in "the Earth of Man."* We have outgrown that literal definition of geography which confines it to a description of the superficial aspect of the earth itself; and we are prepared to concede the broadest claims of Strabo for his favorite science—that "it can be fitly approached only by one acquainted with human and divine things—since in addition to its vast importance in regard to social life, and the art of government, geography unfolds to us the celestial phenomena, acquaints us with the occupants of land and ocean, and the vegetation, fruits, and peculiarities of the various quarters of the

earth, a knowledge of which marks him who cultivates it as one earnest in the great problem of life and happiness."

In the brief hints which the time and occasion will permit, I shall advert to the relations of geography to the Literature of the past, its present and prospective benefits to Commerce, and its service to that Philanthropic Enterprise which is the boast of our age.

Among the marvels of modern science—though some are more striking in a physical aspect—I know of none more wonderful or more serviceable to mankind, than the illustration and confirmation which geography has furnished to the oldest books of History, of Poetry, and of Religion. Within our own generation the researches of geography have so far verified the local and topographical allusions and descriptions of Herodotus, Homer, and Moses, that these alone—apart from historical and philological criticism—would fully identify these fathers of secular and sacred literature with the scenes and times in which they lived.

The reputation of Herodotus has long vibrated between the terms "Father of History" and "Father of lies." Later criticism, however, has settled down upon the conclusion that Herodotus was a true historian, faithful and accurate within the limits of his personal knowledge, but too credulous in recording upon doubtful authority what lay beyond his own observation;—that what is fabulous or questionable in his narrative was not invented by him to enliven the story, but was reported by him in good faith from ignorant or ingenious informants. The travels of Herodotus extended over 1,700 miles from east to west, and nearly the same distance from north to south. In Asia he visited Assyria, Babylon and Susa, Asia Minor and Syria; in Africa, the whole of Egypt to its extreme limits, and the coast as far as Cyrene; in Europe, Greece proper, Scythia and Thrace, and the principal islands of the Levant. His journeys were made leisurely, and as a scholar he commonly had access to the best sources of information. Where he is defective, it is through ignorance or erroneous

* Prof. Arnold Guyot.

report, rather than through fancy or intentional misrepresentation. The discoveries of the present century in Egypt, Assyria, Babylon, and Greece—the identification of ruins and monuments—the deciphering of hieroglyphics and cuneiform inscriptions—have gone to establish the substantial accuracy of the first Greek historian.

But that which, more than any other single fact, confirms and illustrates Herodotus, is the general marked correspondence of his geography with the face of nature in the route of his own travels. Here he is full even to minuteness, and, considering his advantages, wonderfully accurate; but beyond these limits, he was dependent upon tradition, the reports of travelers and mariners, and the imperfect geography of his predecessors in this department—especially of Hecataeus and Aristæas. That he used these sources with caution, however, is evident from the disparaging tone with which he speaks of the maps in use in his day. "For my part," he says, "I cannot but laugh when I see numbers of persons drawing maps of the world without having any reason to guide them; making, as they do, the ocean-stream to run all round the earth, and the earth itself to be an exact circle, as if described by a pair of compasses, with Europe and Asia just of the same size. The truth in this matter," he adds, "I will now proceed to explain in a very few words, making it clear what the real size of each region is, and what shape should be given them."* Certainly the configuration of the earth, as conceived by Herodotus, was a great improvement upon the idea of Homer, whom the historian followed so ardently in his general views.

The incredulity with which Herodotus receives the story of the circumnavigation of Africa by the Phenicians, goes to confirm his general trustworthiness; while we owe to his record of what he regarded as fabulous, the most minute and truthful account of a maritime discovery made centuries before Vasco de Gama.

Upon the whole, there seems no reason to dissent from the conclusion of Rawlinson touching the geography of Herodotus; that "his accounts of countries are, in the great majority of cases, drawn from his own experience, and are full or scanty according to the time he had spent in the countries, in making acquaintance with their general character and special phenomena. Where he has not traveled himself, he trusts to the reports of others; but only, to all appearance, of *eye-witnesses*. If in any case he gives mere rumors which have come to him at second-hand, he is careful to distinguish them from his ordinary statements and descriptions."*

In this view there is a two-fold relation between the science of geography and this ancient book of historical and descriptive travel. While on the one hand we verify the book for substance by means of those geographical features which are permanent, on the other hand we learn from Herodotus the extent of the known world in his time, and the boundaries, as then existing, between civilization and barbarism. We trace upon his map the lines of commerce and of migration radiating from western Asia, following the rivers or seeking the sea from the Indus to Tartessus. Comparing his minute descriptions with the present face of things, we learn also what changes the physical geography of certain districts has undergone in 2,500 years. This is particularly with respect to the Delta of the Nile. The maps of the Delta, as given for example by Schlieden, after Herodotus, Strabo, and Ptolemæus, with special reference to the eastern mouths of the Nile, are a valuable contribution to geology, and have an immediate bearing upon the project of Lesseps for re-opening the connection between the Red Sea and the Mediterranean. Thus, in every point of view, the scholar who would appreciate Herodotus must understand geography as well as Greek. Indeed, only so far as we can assure ourselves of his veracity and accuracy, is he of real value to this age.

In passing from Herodotus to Homer, we

* B. IV, 36. Rawlinson's Ed.

* Introduction, Vol. I.

feel at once the transition from History to Poetry; and are met at the outset with the inquiry whether the poet *had* a geography of fact at the basis of his great epic and romance; whether there was an Ilium of Priam before the Troja or *Ilium Vetus* of classical history; and whether the voyage of Ulysses was to islands now visited by the mariner, or to fairy isles of the poet's own creation. It may help us to answer this preliminary question if we compare the epic poet of Greece with his only two peers, in English and Italian verse. When Milton boldly launches into the infinite abysses above and beneath, we do not think of locality, but strong and safe under his lead, we follow "the broad and beaten way" he paves over the "deep tract of hell," or mount to "the empyrean,"

"Rapt in a chariot drawn by fiery steeds."

We ask for no chart of the regions of the supernatural; but when he maps out for Adam the future empires of his descendants from Cambalu to El Dorado, we feel that in the prolonged and minute description, the poet has exhausted his own knowledge of our globe; so that in the eleventh book of *Paradise Lost* we have the known geography of Milton's time. The heathen mythology wrought into his first book is located according to its national sources and physical boundaries; while his allusions to Biblical Geography are sometimes minutely exact, as this:

"From Paneas, the fount of Jordan's flood,
To Beersaba, where the Holy Land
Borders on Egypt and the Arabian shore."*

While, therefore, the machinery of his epic moves beyond all geographical boundaries, yet to understand and enjoy the copious references of Milton to human history, one must be well versed in geography and archæology, since the poet deals with these as substantive realities.

As for Dante, a fine critic† has remarked, "with what complex precision, as a poetical architect, he has actually, for the purposes of his work, built a universe of Hell, Purgatory,

and Paradise. Every line of his poem has a determinate relation to a certain point in space, fixed in his own mind; but whether every such point be fixed or not in nature, is no more material, than if it were simply to be determined by axes of co-ordinates." Though the opening vision of the poet comes upon him in a gloomy wood, this is but a tangible starting point for that aerial journey which he pursues through circle after circle of the outlying spirit-world. Yet even in that world the spirits of Dante recall the topography of this, especially of that Italy which was to him the scene of his intensest love, and hope, and wo. The poem can be interpreted only in the light of the geographical and political divisions of Italy in the thirteenth century.

But while Milton and Dante open their epics in the spiritual world, the one descending at once into Chaos, the other into the Inferno, Homer begins with human deeds and earthly scenes;—the wrath of Achilles, and the mustering of hostile fleets and armies. He pictures the plain of Troy; the city of its surroundings; Mount Ida with its fountains and forests, and the rivers that flow from it into the sea—the Rhesus, the Rhodius, the Granicus, the divine Scamander; the Ægean sea with its islands from Crete to Lemnos; and the swift rushing Hellespont. We cannot doubt that a real scene is before the mind of the poet, and that he describes Greece and Asia Minor, and the adjacent waters, according to his knowledge of their geography. When Homer introduces the supernatural, he does not, like Milton, challenge us to an

"Adventurous song,
That with no middle flight intends to soar
Above the Aonian mount;"—

His gods are never farther off than the summits of Ida and Olympus, visible to the naked eye; and they descend in palpable forms to mingle in the strifes of men. The *Iliad* is rooted in the soil of Asia Minor, and its perennial flowers breathe over our material civilization, the aroma of chivalry and love from the heroic age.

It was my fortune to pass up the Dardanelles while the allied fleets were lying there, await-

* *Par. Lost*, B. XI.

† Mr. Gladstone.

ing the signal for the Crimean war. As our steamer halted with dispatches for the French Admiral, we witnessed the manning of the yards and the manoeuvres of anticipated battle. In the back ground lay the Troad, with the range of Ida towering to the sky; and at sight of it, the armaments of England, France, and Turkey, with their flaunting drapery, faded from view, and a thousand triremes, manned with Greeks, covered the waters. Homer again called the catalogue of the commanders and all the ships; and above the roar of "the much-resounding sea" came the mellifluous voice of the oldest bard of Greece, singing the fate of Helen, and the siege of Troy. Thus to have the *Iliad* lifted out of the sphere of mere grammar and prosody, and prosaic criticism, brought down also from the ideal past, and fastened by its own geography to shores where fleets and armies yet gather to the fray;—to feel the pulse of a human history, and a common humanity throbbing through the verse of Homer after three thousand years, was worth a voyage from the Hudson to the Xanthus.

The story of Ulysses has in it so much of the element of romance that it is less important to verify its geographical allusions. Yet, the interest of the story is so far enhanced by transferring it from the sphere of the ideal into the actual, that one who has sat musingly beside the "bay of Ulysses" in Corfu, is almost vexed that the learned and eloquent "member for Oxford University" has transported the home of Calypso from that to some imaginary island in the Euxine. Indeed, I do not wonder that, after such violence done to their traditions, the Ionian Islands should reject all the advances of the distinguished envoy of Britain, and that Calypso, disdaining the proffered consolations of Victoria, should again lift up her despairing cry toward the Ithaca of her loved and lost Ulysses.

But while we owe this grudge to Mr. Gladstone, we would gratefully acknowledge the service he has rendered to our science in extricating from chaos the geography of the Odyssey, and projecting a map which locates and

harmonizes so many of the poet's references to lands and seas. And we must believe with him that this "wild and noble romance" was an effort of the poet, shut up "within a narrow and local circle"—"to pass the horizon by strength of thought; to pierce the mist; to shape the dim, confused, and conflicting reports he could pick up, according to the best of his knowledge and belief, into land and sea; to people its habitable spots with the scanty material he could command, everywhere enlarged, made good, and adorned out of the wealth of his vigorous imagination; and to form, by effort of the brain, for the first time as far as we know in the history of our race, an idea of a certain configuration for the surface of the earth. The poet has imbedded into his imaginative scheme a multitude of real geographical physical traditions; and by means of these, upon comparing them with their proper originals, we can judge with tolerable accuracy what were the limits of human enterprise in the face of the earth in this heroic age."*

We find, then, a world embraced within the circuit of Greece Proper and Asia Minor, including also the principal islands of the *Ægean* and the eastern Mediterranean, the definite and intelligible scene of the major part of the actions and movements of Homer's heroes. Within these limits the poet's knowledge of locality was tolerably exact; and here we may reproduce his wars and wanderings of men, and his councils and manoeuvres of the gods, upon a map constructed from his own materials. Strabo, who claims Homer as "the founder of geographical science," would extend the literal knowledge of the poet far beyond this area. But Homer's allusions to Lybia and Egypt, to the Persian gulf, the Euxine and the Caspian, are too indefinite to furnish anything more than a rude outline map of the world beyond the immediate margin of the Levant.

Where to locate the Ethiopians was the great geographical problem of Homer, as it is the great political and moral problem of our own

* Vol. 3.

generation. He found them not only in the south but also in the east and in the west, from the rising to the setting sun, and stretching round to confront the rough Cimmerians of the north,—altogether quite a mysterious and perplexing people, geographically considered. And then beyond his utmost verge of earth, the imagination of Homer, linking the fact that the known world everywhere touched upon the sea, with the fact that the Hellespont joined ocean to ocean, pictured a river-ocean flowing through “the wide-wayed sea” around the world. This conception of Homer—like the prediction of the Medea, and Strabo’s conjecture of another continent lying westward in the Atlantic—is almost a poetic prophecy of that ceaseless current which bears the warmth of the South Pacific along the coast of our entire continent, which mitigates even the cold of the Arctic, and scatters upon the shores of Norway and the Hebrides the seeds of the tropics. Be that as it may, while the “wide-wayed” sea of Time shall roll, changing its configuration with the rise and fall of nations and empires, there shall flow through it a river of song which, gushing from the world’s young life, shall bear to the latest posterity the Ulysses of Homer.

To the scholar who would appreciate the poet as something more than a text-book of Greek prosody, there is a necessity for a definite comprehension of both the real and the imaginary geography of the Homeric age.

As in going back almost twenty-five centuries to Herodotus, we find geography his witness and his interpreter, and in going back five hundred years further, we still find geography a palpable chain of fact linking us to Homer; So, if we shall penetrate seven centuries beyond, we shall still find geography a witness for those Hebrew records which are the oldest reliable documentary history of the world. Indeed, Moses is even more attested by its evidence than either Homer or Herodotus; for while both a poet and historian, his main function is neither poetry nor history as an art, but the record of moral and religious truth, and the

revelation of divine law and promise. In making this record of Divine Providence and revelation Moses gives only those local and geographical facts which are incidental to his religious purpose. Yet, in so doing,—and all the more because of that *incidental* mention of facts and places which assumes a knowledge of these on the part of the reader,—Moses furnishes permanent data of his own authenticity. These, the geography of Egypt, Assyria, Arabia, and Palestine, enables us to test in the most satisfactory manner.

It were possible for God to have revealed to men an ethical code or a system of theology in the abstract style of Plato or of Sir William Hamilton—a system for the schools. But from the beginning, Divine revelation has been closely associated with the personal and the actual of human life and history. While the Euphrates and its cognate streams shall water the region of middle western Asia, men shall not cease to be reminded of the Eden of their great progenitor. While Ararat shall tower among the mountains of Armenia, men shall not cease to be reminded of the historical peopling of the earth by the sacred remnant borne in the Ark from the antediluvian world. While Ur, and Haran, and Damascus, and Sichem, and Bethel, and Hebron, may be identified by living representatives or undisputed monuments, the Israelite, the Ishmaelite, and the Christian, will keep alive the memory of the Father of the Faithful amid the scenes of his eventful life. While the cauldron of the Dead Sea shall simmer with its bitter asphaltic waters, the story of Sodom and Gomorrah shall stand in letters of fire. While the Nile shall roll its fertilizing flood along the margin of the desert, the story of the plenty and the famine of Joseph’s premiership, of the visit of his brethren, and the burial of his father, and the story of Moses in the ark and in the wilderness, will belong to the physical scene. While the bald granite of Sinai shall cleave the clear atmosphere of the Arabian wilderness, the eternal law of right shall speak from every crag, and echo in every vale. The Red Sea

and the Jordan divide again before the wand of the historian; and Nebo still overlooks the land of promise from Hermon and Lebanon to the Great Sea. The Bible is rooted in the soil of the earth while its mountains shall stand—is written on its surface while its rivers shall flow.

But beside this general outline correspondence of the geography of Egypt, Arabia, and Syria, with the sacred record—serving to identify the book with human scenes and history—there are particular and even minute geographical correspondences with the local allusions of the Bible, which authenticate the book beyond the most ingenious objections of a Volney or a Gibbon. The very lists of names in old Testament Geography which so perplexed our childish organs of speech, and seemed to encumber the narrative, have now become witnesses for the authenticity of the book, and the accuracy of its several writers. No geographer of ancient or modern times has passed unscathed of criticism; yet *not one geographical error has been fastened upon the sacred writers, where the text is fully settled, and the reference clearly identified*; and every new explorer of the Holy Land brings to light some new identification of ancient sites, corroborating the historical books of the Bible. Indeed, a skillful cartographer might almost construct a map of Palestine from the allotments of the tribes detailed in the book of Joshua—that most ancient record of title deeds; and the monopolist of hand-books, even while offering his excellent red-covered Guides for the East, assures us that the Bible is the best hand-book for Syria.* Not only the bolder features of the country, but the high-ways, the battle-fields, the fountains, the villages, are mapped out with undeviating accuracy, and by such land-marks as only one writing of things familiar could give. The very peculiarities of climate and soil are indicated by some passing remark of a writer intent upon a moral lesson.

Among the more curious results of Egyptian Archaeology, is the construction, by Brugsch,

of a map of Palestine, from Egyptian monumental sources; that is, the outline of Palestine being sketched from nature. Brugsch* has filled it in only with names of Hebrew towns identified upon the monuments of Egypt—thus making an Egyptian hieroglyphic map of Palestine. The result is a curious and minute confirmation of the Hebrew books of the Kings, where these interlace with Egyptian history. A similar correspondence has been traced to some extent upon Assyrian and Babylonian monuments. In short, the study of the geography of Syria is almost as important for the elucidation of the Bible, as is the collation of manuscripts for adjusting the sacred text, and the science of exegesis for a correct interpretation. Every true Biblical scholar must needs be so far a geographer. A distinguished scholar of Germany, in his recent commentaries on the books of Joshua and the Kings,† assigns as a sufficient reason for a new exposition of these historical books, the fact that Dr. Robinson's researches in Palestine had brought to light such valuable materials for the illustration of the text. It is gratifying to know that this now veteran explorer in this field, is likely, ere long, to garner the latest and best fruits of his life-long studies into a Biblical Geography which shall be worthy of its aim. Without a question, if Palestine shall ever be under a stable and liberal government long enough to admit of its thorough exploration, it will yield an unparalleled testimony to the authenticity and accuracy of the Bible. When that day comes, may so shrewd and competent an observer as the author of "the Land of the Book"‡ be there to take his notes and print them.

While geography is thus the ready handmaid of the scholar in the interpretation of ancient and valued documents, she is also the pioneer and guide of the merchant in commercial adventure. Could a people whose idea of the world is expressed by a Chinese map, ever become a commercial people? With the whole

* Mr. John Murray.

* Geog. der Nachbarländer Aegyptens. † Kiel.

‡ Rev. W. M. Thomson, of Beirut.

world embraced in China, except the tiny outlying island of Britain, the celestial empire constituting the one only terrestrial continent, and this mainly inland, could there possibly be a stimulus to foreign commerce? Commerce with whom, and to what ports? From early times, indeed, China has had a coastwise commerce; but her people have hardly been characterized by the spirit of maritime adventure. But, while the geographical ideas of the Chinese, no less than their social institutions and religious prejudices, have restrained the spirit of commercial enterprise, insular Britain, invited upon every side to tempt the sea, has availed herself of all maritime discoveries to push abroad her empire of commerce till it encircles the globe. Her exploring expeditions, her commissioned travelers, her civil engineers, are pioneers of her merchants and manufacturers, opening new markets from Australia to Labrador.

The bold speculations of geographers have prepared the way for the successful adventures of commerce. It was as a navigator following the configuration of the eastern hemisphere, that Vasco de Gama opened to the commerce of western Europe a new route to the East Indies, when the Turk had gained control of the ancient channels of trade. It was the passion of Columbus for geographical knowledge, nursed by the study of maps and charts, and the information picked up from the sailors of Genoa and Lisbon, that led him forth upon the bold adventure which issued in the discovery of America. The wonderful travels of Marco Polo, then just written, had kindled a new enthusiasm for oriental discovery. The conjectures of Aristotle, Strabo, and Seneca, as to the proximity of eastern Asia to the pillars of Hercules, were made familiar to Columbus through the "Picture of the World," prepared by Cardinal Petrus, of Cambrai; and these conjectures of the earlier geography were the means of inciting the Genoese navigator to seek the Indies by a westward voyage. The ardent pursuit of geographical knowledge opened a new continent to emigration and commerce.

The explorations of Barth and Livingstone in Africa, have already directed the spirit of commercial enterprise toward the interior of that continent, and we shall yet see every navigable river of Africa enlivened by merchant fleets, more fatal to the slaver than ill-manned and sluggish navies. The interior exploration of Russia, of middle Asia, and of South America, is opening new channels for the commercial industry of nations. Every well-planned geographical expedition repays its cost to commerce a thousand fold. No science is more practical or more remunerative than this. He who understands the geography of the world—in the wide import of that term—will know the value and the wants of the markets of the world. A half-witted capitalist in an eastern city once sent a cargo of warming-pans to the West Indies, at the instance of a friend who loved a practical joke. Luckily they were put to use as molasses strainers, and proved a profitable venture; but it would hardly be safe to repeat the experiment. The ill considered kindness which forwarded to a missionary in a tropical island a life supply of beaver overcoats and felt hats, would hardly pass for commercial sagacity. Commerce must ever adjust itself to the great laws of climate and of physical distribution, which geography ascertains and reports for her guidance.

I have already hinted at the relations of geography to that spirit of Moral and Philanthropic Enterprise which makes the elevation of Humanity the crowning aim and glory of our times. We cannot dissociate the earth from man. Geographical and national insulation is a barrier to that sympathy of race which proclaims our common humanity. But Christianity overleaps that barrier with her divine commission to "go into all the world, and make disciples of all nations." Thus far the advancing periods of civilization, as both Guizot and Guyot have noted, have not succeeded each other as developments upon the same soil, but have advanced from country to country, and from continent to continent, in an order which is styled "the geographical march of history."

But that higher civilization toward which we aspire knows no boundary within the confines of the habitable globe. The spirit of geographical discovery which prompts a Franklin and a Kane to explore the frigid zone, and a Barth and an Overweg to penetrate within the tropics, summons our Christian philanthropy to visit the Esquimaux and the Ethiop with its kindly influence. We have no longer an inner and an outer geography—an inner world of seclusive civilization, an outer world of proscribed barbarism—but we find *one* earth from pole to pole, and through all the conditions of the human family a common moral nature susceptible of the same virtues and vices, the same knowledge, desires, affections, and hopes, and the same social elevation. No sooner does the geographical explorer cry "Land ho!" "a new island, a new continent is found," than Christianity exclaims, "this, too, is mine!" and forth she goes with her divine ministrations to every creature. "It was from the perusal of 'Cook's Voyages round the World,' and while employed in giving instruction to his pupils at Moulton in geography, that Mr. Carey was led to contemplate the moral and spiritual degradation of the heathen, and to form the noble design of communicating the gospel to them. When he was subsequently constrained to relinquish the school and return to manual occupation, the same idea was still uppermost. Mr. Fuller has related that, on going to his little workshop, he saw a large map suspended on the wall, composed of several sheets pasted together, in which he had entered every particular he had been able to glean relative to the natural characteristics, the population, and the religion of every country, as then known to us. While engaged in making or mending shoes, his eye was often raised from the last to the map, and his mind was employed in traversing the different regions of the globe, and musing on the condition of the various heathen tribes, and devising the means of evangelizing them."*

* *Life and Times of Carey, Marshman, and Ward.* London. Vol. 1, p. 9.

And so the geographical and statistical studies of a poor cobbler led to that great enterprise of the *Christian* civilization of India, which is a higher glory than all the conquests of Britain in the East.

The first exploring expedition of the United States brought accurate reports of the islands of the South Pacific and their inhabitants; those islands are already included within the domain of Christian missions. And if the next expedition to the North shall find some peopled island in the Polar Sea, it will herald the advent of that Christian philanthropy which shall turn the Arctic Night into perpetual Day. Geography circumscribes the globe with latitude and longitude; Christianity enspheres it with light and love.

But while Christianity thus follows immediately upon geographical discovery, eager to fulfil her mission, she often anticipates both science and commerce, and by her zeal for man's highest welfare opens new domains for all material progress. The arts and manufactures of Britain will owe to a humble missionary of South Africa a debt which honorary titles and guinea testimonials can never cancel. Ritter and Humboldt acknowledge the eminent services of missionaries to geographical science.

Such, briefly sketched, is the dignity and value of the science to further which this Society is organized. We associate with geography the kindred and almost inseparable science of Statistics; not the mere accumulation of facts and figures, but the scientific classification of all the phenomena of human life and society, economical, numerical, social, political, vital, moral, and religious. Regarding these, not from Mr. Buckle's stand-point, as blind fixed forces, of which human actions are a necessary resultant, nor as being in themselves a law for man, but as themselves under law, and evidences to man of his present condition and necessities; we would derive from the statistics of nature and mankind, information and suggestions for the great ends of social and moral improvement. The field opens invitingly before us. Though the youngest *National Society*

in these departments, we find that the oldest of kindred institutions abroad have been in existence but a third of the century, and yet have taken rank with the first institutions of science, and have greatly enriched its literature with the results of their inquiry and discovery. Entering at once upon their labors, and enjoying the fruits of their successes, we have before us in our country, and upon our own continent, a field from which we should gather fruit for exchange with the whole world of science. If our national vanity makes us jealous even of foreign exploration upon this continent, our national pride, and the just and liberal enterprise of science, should lead us to perform that work for the benefit of mankind. We should demonstrate to the world that republicanism and filibusterism are not identical; and that royal patronage and hereditary wealth are not necessary for the culture of a scientific spirit. With such a field, and such a work before us, we confidently invite the co-operation of our fellow citizens. We open our rooms to the scholar, the merchant, the philanthropist, to each and all without distinction of school or sect. In seeking the advancement of this Society, we are seeking the honor of our city and country. If the day shall come when the American Geographical and Statistical Society shall occupy a building of its own, its ample halls adorned with the historical maps, and the most recent surveys, its library furnished with all that science and travel can supply in its department, and its statistical bureau with all reliable information duly classified, and freely proffered to the editor, the merchant, the manufacturer, the physician, the statesman, and the philanthropist,—they who have built the structure shall win the grateful honor of their generation, and bequeath to posterity a deathless legacy of fame.

TEXAS.

The value of taxable property in Texas has been increased as follows: In 1850 it was \$53,-563,671; in 1852, \$80,754,094; in 1854, \$126,-981,617; in 1856, \$161,504,026; and in 1858, \$192,287,377.

GEOLOGY OF NEW JERSEY.*

The principal geological formations in New Jersey cross the State in a N. E. and S. W. direction. The rocks which are so prominent upon the upper part of New York island, and which underlie the whole of it, extend on toward the S. W., appearing on Diamond Reef, just off the Battery, then at the quarantine landing on Staten Island, and again a few miles this side of Trenton, on the Delaware, whence they extend across Pennsylvania, Delaware, and Maryland, and on farther south. The line following this range across New Jersey, divides the State into two parts, each of which possesses very marked and peculiar geological features. In studying the geology of the northern region, it may be considered as divided into three parts:

1. The primitive region, embracing its central part, which is the extension of the Highlands.

2. The region lying on the north-west, constituting what is known as the Kittatinny Valley and the Blue Mountains.

3. The S. E. border of the northern division, which is characterized by the red sand-stone as the principal rock, and the ridges of trap which traverse it in various directions.

The primary region toward the N. E. is remarkable for its mountains and for the irregular and broken character of its surface. It seems to be made up of continuous ridges, which are separated by narrow valleys. The passage across the country is laborious, and the promise for agricultural improvement extremely poor. Toward the S. W. the valleys become wider, limestone and other secondary rocks are found, and large portions are noted for their agricultural wealth.

The rock is metamorphic, usually intermingled with gneiss; its strata are highly inclined, and in almost all cases dip toward the S. E. There are several localities, where white limestone is

* Outline of remarks made by Prof. J. H. Cook, of Rutgers College, New Jersey, before the Am. Geo. and Stat. Soc., on the organization of the Section on Geology, Jan. 28, 1858.

found in connection with the gneiss. One near Mottville, is remarkable for the beautiful specimens of asbestos and serpentine, which accompany it, and the belt of white limestone, which extends along near the S. E. base of Pochneck, Mt. Pimple hill, and the lower hills beyond. This limestone is interesting to the mineralogist for the many rare and beautiful minerals found imbedded in it. It is especially remarkable for containing the only known localities of red oxyde of zinc now extensively used in the manufacture of white paint. Whether this limestone is of the same age with the gneiss, or whether it is altered from the blue limestone is a question, on which there is some difference of opinion among geologists. In several of the valleys a blue limestone is found, which, from its fossils, is evidently the Black River limestone of the New York system. Professor Rodgers advanced the opinion that it was newer than the coal formation, but from the silurian fossils found in the rocks adjacent to it, there seems good reason for placing it among the older silurian strata. The occurrence of these fossiliferous rocks in the midst of a primary region, and their lying in a highly inclined position in the valleys—indicate the powerful elevating and disturbing forces which have operated upon them. This region is rich in iron ore of an excellent quality. The ore is found over a large portion of the belt, more abundant in the central and northern parts than in the southern and western. They are, however, not continuous veins. Some of them appear upon the surface for a few feet or rods only, while others may be traced for a mile or more. The veins vary in thickness from a few inches to 60 and 70 feet, and the same vein varies in thickness in different places. In dip they conform to the rock in which they lie; and irregularities in thickness and terminations of the veins, instead of taking a vertical or any uncertain direction beneath the surface, uniformly descend toward the north-east.

It has been found by a careful examination of the structure of these veins, that the supply of ore which can be obtained from them will

never cease by exhaustion—but will continue till the cost of raising it to the surface exceeds its value. It gives new interest to this region, lying as it does, at our very doors, that it offers an almost inexhaustible supply of this indispensable metal. The origin of these ores, though apparently a purely speculative question, is one which has important practical bearings, and a correct theoretical knowledge of their origin will aid much in opening and working the mines. The quality of iron made from these ores is much superior to that obtained abroad; and in quantity, according to the statement of Dr. Kitchel, capable of yielding a million of tons a year for many years to come. Dr. Kitchel advances the opinion that these mines of ore or veins, are of a sedimentary origin, like the rocks in which they are found, and that with those rocks they have since been changed in structure, appearance, and perhaps in composition. Bischof endeavors to explain the formation of magnetic iron ore by chemical action. Starting with the fact that many common rocks contain oxyde of iron, some enough to make 28 per cent. of the magnetic ore, he goes on to reason that this is a source sufficient to furnish an amount vastly beyond that found deposited in veins, and that no great stretch of imagination is needed to supply the chemical force, which would bring these disseminated particles of iron from the rock in which they are imbedded, and collect them in the veins or strata of ore.

The district lying to the north-west of the State is a broad and elevated valley lying between the Blue Mountain and the Highland ranges, extending from the New York State line on the north-east, to the Delaware on the south-west. This beautiful country is known as the Kittatinny Valley. Its rocks principally belong to the Black River and Hudson River formations of the New York survey. It is a rich agricultural and grazing district. The geological formation most prominent here is the same as in the rich grazing districts of Orange, Dutchess, Columbia, Rensselaer, Washington, Herkimer, Lewis and Jefferson counties in this

State, and it is equally noted with those counties for the quantity and quality of its dairy products. Passing from the north-west to the south-east, we come upon a region widely different. Its principal rock consists of red shale and sandstone, with intruded veins and ridges of trap traversing it in various directions. It covers nearly half the northern division of the State, and is part of the extensive formation much developed in the valley of the Connecticut river, through almost the whole of the States of Massachusetts and Connecticut; appears again on the Hudson a little below Stony Point, and extends onward south-westward across all the States to South Carolina. The Richmond coal field is in this rock, and also the Deep River coal field of North Carolina. The precise equivalent of this formation to the rocks of Europe, has been the subject of spirited discussion among our prominent geologists, Professors Rogers, President Hitchcock, the Messrs. Redfield, Dr. Emmons and others, for a number of years. It is well known to be more recent than our coal formation. Some new fossils recently discovered by Dr. Emmons, have done much to strengthen the opinion advanced by him that they are of the age of the Trias. The difficulty of the case arose from the extreme scarcity of fossils in the rocks. In New Jersey, indistinct remains of plants are not uncommon in the red sandstone quarries, and very distinct impressions of fishes have been found at Pompton and Boonton in this rock. Fossil footmarks, so abundant and remarkable in the red stone of the Connecticut Valley, have never been found in this formation in New Jersey. Thin seams of coal have been met with in several localities, but not in quantity to encourage mining for it. The dip of this rock is toward the north-west—just the reverse of that of the formations lying on either side of it—and this circumstance has been the cause of much speculation in regard to its deposition. The belt in its broadest part is more than twenty miles wide, and has a dip from 10 to 20 deg. to the north-west. The trap rock which forms the abrupt ridges, so characteristic of the sur-

face of this formation, has not materially disturbed the dip of the red sandstone. Slight chemical changes have been effected in some localities, by which copper or its ores have been collected at the junction of the two rocks. This is the case at Somerville and at Belleville also. This region is rich in agricultural wealth and development. It abounds in lovely scenery.

The southern division of the State is but little elevated. The Neversink and a few other hills rise to the height of nearly 350 feet; and the central elevation or backbone of the district has an average height of about 200 feet; but so gentle are the variations of surface, that one can pass entirely across the State without being conscious of any elevation whatever. The prevailing soil is more or less sandy, and the vegetation such as is peculiar to light soils. There is a total absence of extended rock formations; all the materials found even in boring wells to the depth of 300 or 400 feet, are soft and earthy in character.

Passing over the State from the N. W. to the S. E., as in the section from Trenton to Long Branch, we cross those which are successively higher, until we arrive at those which are now in process of formation. These successive strata belong to three distinct geological periods. Commencing at the N. W. border, the several strata of plastic and marly clays, of green sand and ferruginous sand, belong to the cretaceous formation. The central or S. E. portions of the district belong to the quaternary system of the N. Y. geologists—drift or diluvium constituting all of it except the sand beaches along the shore, the tide marshes and a fringe of upland bordering them, which belong to the alluvial or recent formation.

CRETACEOUS FORMATION.

The lowest stratum of the cretaceous formation has much economical importance from its containing extensive beds of pure and fine potters' clay. These clays have evidently been formed from the disintegrated material of the gneiss rock, which has been before pointed out at Trenton, and in the same line at Staten Island and which, I have no doubt, once formed

a continuous ridge between these two points. At Trenton the quartz, mica, and decomposed feldspar, or Kaolin, are found lying together upon the solid gneiss rock. In other places, as at Woodbridge and on Staten Island, the mixed materials are found and no rock near them—and in many other places the materials are found as they have been sorted by the action of the water—quartz in the condition of sand in one place—mica in another, and the Kaolin or clay, in still another. It is rare that so fine an exhibition of the origin of white clay is to be seen. The best qualities are obtained at Woodbridge, South Amboy and Trenton. The trap ridge in the centre of the State, and the heavy deposits of diluvium south of it, have buried the clays so deep that none are exposed there. An immense quantity is consumed every year in the manufacture of fire brick. Clay for the common varieties of pottery is also taken from this formation; and a small quantity is also used in the manufacture of fine porcelain. The black clay which lies immediately over the white is a stratum of no economic importance, except as it furnishes the basis for an excellent soil. It contains few, if any, animal remains in its lower bed, but trunks and branches of trees are very abundant. The upper part of this clay contains scattering grains and small masses of green sand; and shells, teeth, and other animal remains indicating that a new order of things, is found.

The succeeding formation is characterized by containing beds of a peculiar mineral substance called "*green-sand*." It appears in small grains like gunpowder, usually some shade of green in color, and so soft that it can easily be crushed upon the thumb nail. Its composition is complex, principally a silicate of iron, aluminum, magnesia and potash. Its fertilizing power has been ascribed to the potash, and to the carbonate and phosphate of lime, which it contains. All these doubtless contribute to its value; those containing the largest per centage of phosphate of lime are most esteemed. The formation is evidently of marine origin; it is filled with the remains of such animals as inhabited the sea. Shells

somewhat resembling those of the oyster are abundant. Bones of saurians, turtles and fish, are common. In all cases, however, they are of extinct species. To the theoretical geologist it is extremely interesting, as filling up an interval wanting in the geological series in Europe, and showing that instead of there being an entire destruction of animals at the close of the cretaceous period, and a new creation at the beginning of the tertiary, there was a gradual dying out of the older forms, and an equally gradual introduction of the new ones, and that while this change was going on, cretaceous and tertiary forms were living in the same waters at the same time. The green sand occupies three narrow belts on the N. W. and S. E. of the State; it is so exposed, that its advantages are experienced over a belt of country 20 miles wide and 90 miles long. The whole formation appears to have been elevated to its present height by some force which was very uniform in its action. Not the slightest disturbance is to be perceived, and yet it must have been thus elevated, for its fossils are evidently of marine origin. This fact in regard to the fossils can only be explained by supposing that these strata have been elevated more upon their north-western, than upon their south-easterly edges, and thus brought to their present inclined position. The green sand is most exposed upon sloping grounds, especially on the banks of streams, and this has given rise to very erroneous notions in regard to its position. It is thought by many that it has been formed in the valleys of streams, and in no other localities. Now that a correct knowledge of its geological position has been obtained, enterprises for diffusing its benefits over a more extended area are planned or in operation, with promising prospects of success. The amount of this fertilizer which is accessible, is immense. A square foot of surface will yield a ton, an acre 43,650 tons, and a square mile more than 27 million tons.

There are a great many square miles of it. The occurrence here of this immense and much needed supply of fertilizing matter, brought

from the deposits of the sea, is an interesting example of that compensating action which is going on in every department of the material world. Chemists tell us that the air of our atmosphere is kept in a state of almost uniform purity by the reciprocal action of plants and animals upon it. Carbonic acid, which is rejected from our lungs as worthless and even poisonous, is the food of plants, and they are continually taking it from the atmosphere to supply the materials for their growth; the carbonic acid is decomposed, its carbon becomes part of the vegetable structure, and its oxygen returns to the air to render it pure and wholesome. In the aquarium, the balance of animal and vegetable life is so adjusted that with no supplies from without, both forms maintain a healthy existence, each supplying what the other needs for food, and removing that which, if accumulated, would become hurtful. The action of geological agencies in bringing from the ocean that which seems lost, is another example of the same kind, with only the difference that the vibration of the balance is longer. Rains and other causes are continually carrying the elements of fertility from the soil to the streams, and so on to the sea, and immense quantities of the richest of the soil are carried away, apparently to be lost forever. But in the progress of geological change they are again brought to the surface, once more to bring back fertility to the wasted soil, and verdure to the exhausted fields.

The whole country has been benefitted by the presence of this bed of fertilizing green sand. The fine crops produced by its use have stimulated farmers to greater exertions; better systems of husbandry have been adopted, and now that they have tasted the profits of good farming, progress is visible in every direction.

The large tract lying to the south-east of the green sand has hitherto been an unpromising field for geological as well as for industrial pursuits. The prevailing soil is light or gravelly, the timber pine, or a scrubby growth of oak. Another portion comprises the strip

bordering on the Atlantic shore and Delaware Bay. Its width in some places is only a few rods, in others several miles. That portion of it which is dry upland, closely resembles the older formation on which it lies, and is distinguished from it only by the greater fineness of the earth, and by containing remains of trees and of shells of species still common in the vicinity. The striking peculiarity of the case is that they should be found so much out of place. Shells unchanged in appearance, and bearing every mark of being in the places where they lived and died, are found at various elevations up to 10 or 12 feet above high water mark, and imbedded in earth as dry and solid as any other upland soil. Stumps and trunks of trees are found in similar condition, some buried below the present tide level, and others above it. The soil being formed from the washings of that above it, is among the most productive in the State.

The low sandy islands or banks, or beaches as they are commonly called, standing immediately upon the ocean, also belong to this formation. They extend along the whole of our Atlantic shore, and are to be found on Delaware Bay and Sandy Hook. These beaches are composed entirely of fine white sand. They rise from two to thirty feet above high water, the average being not more than eight or ten feet. Some of them are bare sand, but most are covered with bushes and trees. On the side next the ocean the sand is in the form of rounded or irregular hillocks—but on the opposite side, and in some cases over a large part of their surface, it is arranged in long narrow ridges, which, though only three or four rods in breadth, and 10 or 12 feet high, extend unbroken the whole length of the beach, which is several miles. This peculiarity of surface exists on all the beaches. It can be seen on Sandy Hook, but it is not so prominent a feature there as upon the beaches opposite Cape May. The ridges are covered with old and heavy timber, and are usually designated as the "Old Beach." The hillocks, covered with a younger and much lighter growth, constitute "Young or Little

Beach." The beaches undergo no changes of importance on the side next the marsh or upland. The higher flow of the tides is killing the timber on the lower parts, and salt grass now grows where bushes or trees formerly flourished. But the changes are slight. On the sea side, where they are exposed to the full force of the wind and waves, they are rapidly wearing away. Every year the hillocks are drifting in and the beaches growing narrower. In some places the sea has broken entirely across them, and the sand is spread out upon the surface of the marsh. A singular fact connected with their extension in length is worthy of notice.

The beaches below Great Egg Harbor, and all, I presume, below Barnegat, are continually extending at their S. W. extremities. The sand points which they put out gradually crowd the inlet before them, until it comes close to the N. E. end of the next beach, when the sea breaks over the point at the original location and a new inlet is formed, which again travels over the same space. The beaches on Long Island also extend themselves westward, but Sandy Hook and those next south of it, extend in the opposite direction. The point of the Hook is said to have increased in length over a mile within the last hundred years. In the early maps of the Hook, it is represented as being a point of the Highlands, and Shrewsbury and Neversink rivers run directly out to the ocean. In 1778, the sea broke through between Sandy Hook and the Highlands, and the former became an island. The extension of the land beaches above Long Branch continued to force the mouth of Shrewsbury river further and further North, until in 1810 they closed it entirely, and the only outlet for the river was between the Highlands and Sandy Hook. In 1830, the sea opened a passage across the beach near the former mouth of the river. This inlet, as it was called, was continually shifting its place moving always toward the North till in 1848 it was a mile North of its original position. In that year it was closed and has remained so ever since. A correct theory of the origin of

these beaches and a full exposition of the changes they are undergoing, are needed. *A modifying control of their causes would do much to improve the navigation in the principal approach to this city.*

Between the beaches and the upland is a large extent of *tide marsh*. This, too, is of a very recent date—indeed it is rapidly forming now. Occupying the comparatively quiet space behind the beaches, and still penetrated in every direction by channels and thoroughfares which admit the ocean water freely, aquatic plants of every kind find congenial situations and thrive. Mud is deposited among them, and thus a sod is formed which continually keeps its upper surface at the level of high water, and pushes its edges farther and farther into the sounds and bays.

The marsh not only encroaches on the water surface, but appears also to be gaining on the upland. Shallow as it is seen to be on the margin, and with the upland rising by a very gentle slope, it requires but a slight rise in the water to carry it forward over a considerable breadth; and in this respect, very marked changes have been observed since the first settlement of the country. Numerous places are known, where upland trees formerly grew, which are now covered by the salt marsh, and on which no fresh water plants can grow. And roots, and in some cases, trunks of trees, are frequently found where they grew, which are now several feet below the level of high tide and buried in marsh mud. This encroachment is to be noticed wherever the marsh meets the upland or the beaches. The same fact is equally marked on Long Island and on the shores of Chesapeake bay.

These facts all go to show that now, as in the preceding periods of geological time, motion and not rest is the condition of the earth's surface—that our own shores are undergoing a gradual subsidence, a change so slow that its effects are not seen in a year or even in a score of years; but in a life time, is well marked in the advance of marsh upon upland, in the increased power of the sea to wear away the land, and in the deepening of open channels.

Upon the conclusion of this paper, Ex-Governor Horatio Seymour proposed a vote of thanks to Prof. Cook for his admirable paper. He alluded to the importance of the study of geology, and related some remarkable and very interesting facts, regarding the early history of the British settlers, showing where, with the proper appreciation of geological knowledge, fortunes have been made, and want or disregard of that knowledge has been attended with enormous losses.

EXPLORATION OF THE ROCKY MOUNTAINS IN THE BRITISH POSSESSIONS.

At a recent meeting of the Royal Geographical Society, a paper was communicated by Sir E. Bulwer Lytton, Colonial Secretary, giving the results of the explorations of the Rocky Mountains lying in the British Possessions, made by Capt. Palliser, under the direction of the British Government. The paper states that several practical passes had been discovered leading through the mountains, which are enumerated as follows:

1, from the south branch of the Saskatchewan to Kutanie river, two—i. e., Kananaski Pass and Vermillion Pass; 2, from Kutanie River to Columbia, two—i. e., the Lake Pass and Beaver Foot Pass; 3, from the south branch of the Saskatchewan to north branch, one—i. e., the Little Fork Pass; and 4, from the south branch of the Saskatchewan to the Columbia one—i. e., the Kicking Horse Pass. In addition to these discovered passes, the Northern Kutanie Pass has been laid down, and found to be entirely within the British territory, and has been named British Kutanie Pass. After the reading of these highly important papers, the President, in commenting upon the reports which had been read, reminded the Fellows that the expedition was fostered in the first instance by the Geographical Society, and that they had therefore great reason to be proud of successful results as those which had attended it. After briefly alluding to the praiseworthy efforts made by Palliser and his associates, Hector, Blackiston and Sullivan, in a preceding year, in defining the nature of the great region between Lake Superior and Lake Winnipeg, and thence extending to the Red River Settlement, (a region also explored by men of science sent thither by the Canadian Government,) he begged the gentlemen who might be disposed

to speak, to confine their attention chiefly to the last discoveries, which indicated, first, the rich quality of the soil over a vast prairie country, watered by the upper affluents of the north and south Saskatchewan River, and next the existence of passes through the Rocky Mountains within the British Territory—i. e., between 49 deg. and 51½ deg. north latitude, which had been for the first time examined by men of science, who had determined the geographical position, the relative altitudes of the mountains, and their mineral characters. He pointed out that it was a remarkable and satisfactory *datum* that, although in this portion of its range the chain rose to much loftier summits than in its prolongation to the south, the depressions, or passes, in it were now shown to be about 2,000 feet lower than those by which the Americans can travel into the central parts of California. After adverting to the great interests which necessarily attached to these discoveries in relation to the establishment of a line of intercourse between the great eastern or Atlantic watershed of British North America and the newly established colony of British Columbia, with its gold fields on *terra firma*, and the great coal deposits of Vancouver's Island on the Pacific, he hoped that persons who had long studied the subject, such as Mr. John Ball, lately of the Colonial office; Mr. Edward Ellice, who had so much knowledge of British North America, and so large a stake therein; Lord Bury, who had recently returned from that country, &c., would address the meeting. Mr. Ball and Lord Bury having spoken at some length, the President, in adjourning the meeting, stated that Sir E. B. Lytton, had not only kindly communicated the despatches which had been read, but had further acceded to the request of Capt. Palliser and Dr. Hector that they might be permitted to return to England next summer, revisiting the passes they had discovered, and exploring British Columbia on their road to the shores of the Pacific.

It is to be regretted that the elevation of the above described passes was not given absolutely instead of by comparison with those over which Americans pass on the central route between the Eastern States and California. One of these, called the Cochetope, is 10,000 feet above the sea. The passes lying next to this, both north and south, are elevated 8,000 feet; so that if those discovered by Capt. Palliser are 2,000 feet lower, still they are equally elevated as the pass on the line of the

proposed railroad, in the parallel of 47°. But it must be borne in mind that the plains at the eastern base of the Rocky Mountains are much lower, probably 1,500 feet, in the British Possessions than in the United States. Their ascent, consequently, may be much more abrupt and difficult than of those in the United States. It is not so much the absolute height of the ground that is the chief obstacle to the construction of a railroad, as the shortness of the distance by which it is to be overcome.

The Report of Capt. Pallisser is looked for with much interest. It must prove of great value in illustrating the geography of the country, as well as in reference to the proposed lines of railroad across the continent.

DEPARTMENT OF STATISTICS.

STATISTICS OF AMERICAN STATES.

NO. 4.

REPUBLIC OF PERU.

Lat. 3° 35' to 21° 48' S. Populat'n (1852) 2,106,492.
Long. 68° 10' to 81° 30' W. Density, 4.22 to sq. mile.
Area, 498,726 sq. miles. Capital, LIMA.

CONSTITUTION.

Executive.—President, elected by the people through electoral colleges, for six years.

Administration.—1. Minister of the Interior and Religion; 2. Minister of Foreign Affairs and Finance; 3. Minister of War and Marine; 4. Minister of Justice and Public Instruction.

Council of State.—All the Ministers and such Senators as Congress may nominate. The President of the Council supplies the place of President of the Republic, in case of his removal, inability, or death.

Legislature.—A Congress, consisting of a Senate composed of two members from each department, and a House of Deputies, composed of one Deputy for every 20,000 inhabitants.

Judiciary.—A Supreme Court at Lima; and Superior Courts at Lima, Cuzco, Arequipa, Trujillo, Ayacucho and Puno. In the provinces, Courts of First Instance, and in the districts, Justices' Courts. There are also special mining, military, and other courts.

National Religion.—The Holy Apostolic Roman Catholic. The Church is under the supervision of the Archbishop of Lima, and the

Bishops of Arequipa, Chachapoyas, (Maynas,) Cuzco, Huamanga and Ayacucho, and Trujillo.

HEIGHTS OF THE PERUVIAN ANDES.

Names.	Lat. S.	Long. W.	Hgt., ft.
Sabana	18° 07'	68° 52'	22,350
Parinacota	18° 10'	69° 11'	22,030
Gualateiri	20° 13'	69° 17'	21,960
Pomarape	18° 08'	69° 03'	21,700
Chuquibamba	16° 06'	72° 16'	21,160
Chipicani	17° 43'	69° 47'	19,748
Arequipa (vol.)	16° 19'	71° 23'	18,373
Apucunurunu	14° 10'	70° 20'	17,525
Viuda Pass	10° 45'	76° 30'	15,968
Lagunillas Pass	15° 52'	71° 15'	15,590
Raya Pass	14° 25'	70° 40'	14,520
City of Cuzco	13° 31'	72° 04'	11,380
Chiquiacoba Lake	16° 45'	75° 30'	13,200

RIVERS OF PERU.

1. *Emptying into the Pacific Ocean.*—Tumbez, Chira, Sechura, Jequitepeque, Sana, Viru, Santa, Patavilca, Huaura, Chillon, Rimac, Mala, Canete, Pesco, Ocona, Camana, Quilca, Tambo, and Loa.

2. *Emptying through the Amazon into the Atlantic.*—Tunguragua or Marañon, Huallaga, Ucayali, (formed by the Pachitea, Apurimac and Beni,) and Yavari.

CIVIL DIVISIONS AND POPULATION.

Peru is divided into eleven departments, and two provinces called "littorales," having the organization of departments. The departments are divided into 61 provincias, subdivided into 625 distritos, and these into partidos or parishes. The government, civil and economical, of each department, is in charge of a prefect, dependent directly on the President of the Republic; that of each province is in charge of a sub-prefect, dependent on the departmental prefect; that of each distrito or district is in charge of a governor; and that of each partido in charge of a sub-governor.

The following table exhibits the extent and population of the departments:

Departments.	Area, sq. m.	Population.	Capitals.
Amazonas	96,276	43,074	Chachapoyas.
Ancach	23,928	219,145	Huarez.
Arequipa	36,117	119,336	Arequipa.
Ayacucho	32,829	132,921	Huamanga.
Cuzco	72,124	349,718	Cuzco.
Huancavelica	14,284	70,117	Huancavelica.
Junin	85,338	222,949	Cerro de Pasco.
Libertad	27,444	266,563	Trujillo.
Lima	24,288	250,801	Lima.
Moquegua	39,198	61,432	Tacna.
Puno	25,918	285,661	Puno.
Provincia de Callao	216	8,453	Callao.
" de Piura	20,766	76,332	Piura.

Total.....498,726 2,106,492 LIMA.

The *provinces*, named chiefly after their principal towns, are as follows:

Provinces.	Population.	Provinces.	Population.
AMAZONAS—		HUANCANELICA—	
Chachapoyas	27,728	Angaraes	20,300
Maynas	15,346	Castrovireyna	15,348
ANCASH—		Huancavelica	17,318
Cajatambo	24,799	Tayacaja	27,151
Conchucos	54,751	JUNIN—	
Huari	48,579	Huanuco	26,799
Huaylas	84,676	Huamallies	32,027
Santa	6,340	Jauga	93,712
AREQUIPA—		Pasco	70,411
Arequipa	63,816	LIBERTAD—	
Cailoma	23,443	Cajamarca	46,122
Camana	14,418	Chiclayo	26,123
Union	17,659	Chota	62,597
AYACUCHO—		Huamachuco	60,854
Andahuaylas	19,184	Jaen	8,560
Cangallo	20,027	Lambayeque	24,682
Huamanga	29,617	Patas	29,394
Huanta	26,358	Trujillo	8,221
Lucanas	17,401	LIMA—Canete	17,653
Parinacochas	19,334	Canta	16,384
Cuzco—		Chancay	25,600
Abancay	21,912	Huachiriri	14,400
Anta	31,300	Ica	41,500
Aymaraes	18,228	Lima	120,000
Calca	16,223	Yauyos	15,264
Canas	37,605	MOQUEGUA—	
Chanchis	36,400	Arica	18,642
Chumbivilcas	23,250	Moquegua	32,380
Cotabambas	23,241	Tarapaca	10,410
Cuzco	41,152	PUNO—Azangaro	54,333
Paucartambo	17,026	Carabaya	22,138
Paruro	17,732	Chuquito	75,959
Quispicanchi	20,700	Huancane	50,765
Urabamba	39,949	Lampa	76,468

The *principal cities*, capitals of departments, are as follows:—Chachapoyas, 4,600; Huaras, 5,500; Arequipa, 38,000; Ayacucho, 18,000; Cuzco, 47,500; Huancavelica, 5,500; Cerro de Pasco, 14,000; Trujillo, 6,500; Lima, 100,000; Tacna, 10,000; Puno, 8,600; Callao, 6,000; Piura, 12,000.

NATIONAL FORCES.

Militia—All male citizens between the ages of 18 and 45 years.

Standing Army—About 6,000 men, and organized as follows:

Artillery—2 foot batteries, 1 horse squadron.
 Infantry—8 battalions of 3 companies.
 Cavalry—3 regiments, (hussars, chasseurs, and lancera.)
 Corps of engineers.

The artillery is equipped with 24 twelve pound cannon, and a like number in reserve. The infantry is armed with Minie rifles; and the cavalry with ball-proof cuirasses and Sharp's carbines.

The official staff in 1856, consisted of 2 grand

marshals, 5 generals of division, 22 generals of brigade, 142 colonels, 158 lieutenant-colonels, 201 majors, 404 captains, 456 first lieutenants, 418 second lieutenants, 11 commissaries, and 37 surgeons—total, 1,856. Of this number there were 418 on leave, with pay; 274 invalided, with pay; 280 retired with pensions. At the same date, 528 widows and children of officers were receiving pensions.

National Navy—In 1856 the navy was constituted as follows:

2 frigates (33 and 46 guns)	79 guns.
2 steamers (10 guns)	20 "
4 small steamers (6 guns)	24 "
1 brigantine	14 "
1 mail boat	
5 transports, etc.	5 "
15 Total	142 "

The *personnel* of the fleet consisted of 3 admirals, 40 captains, 17 first lieutenants, 18 second lieutenants, 40 midshipmen, 20 marine officers, 51 pursers' clerks, 7 surgeons, and 11 pilots. The infantry of marine composed one battalion of 458 men; and the number of seamen was 428.

PUBLIC FINANCE.

According to the estimates for 1857, the receipts would amount to \$18,656,256, and the expenditures to \$16,360,051.

Receipts.

From customs duties*	\$2,263,282
" sales of guano	15,296,952
" other sources	1,096,022

Expenditures.

Ministry of War and Marine	\$5,392,202
" of Interior and Religion	3,825,248
Miscellaneous	3,806,901
Debt	1,406,636
Interest	1,929,064

The *public debt* on the 1st January, 1858, consisted of:

Domestic Debt—Consolidated	\$10,134,969
" Floating	1,784,918
" All other	4,531,500
Total	\$16,451,387
Foreign Debt	30,000,000
Total Public Debt	\$46,451,387

NATIONAL COINAGE (1855.)

Silver (in 5, 10, 20, 50 and 100 cents)	\$1,546,196
Gold (in 5 and 10 dollar—Condor—pieces)	650,175
Total Coinage	\$2,196,371

* The Customs revenue in 1855 amounted actually to \$3,766,814, and in 1856 to \$3,279,566.

FOREIGN COMMERCE (1853.)

1.—Value of Exports and Imports.

	Imports.	Exports.
Australia	\$117	\$.....
Bolivia	30	11,594
Brasil	25,388	26,907
Buenos Ayres	11,582	.....
Central America	77,105	.....
Chile	654,007	497,437
China	289,496	.....
Denmark	64	14,000
England	4,616,291	8,818,827
Ecuador	196,828	8,283
France	1,883,781	1,441,606
Germany	10,877	27,681
Hamburg	486,327	214,814
Holland	382	24,500
Italy	42,903	60,715
Mauritius .....	.....	80,055
Mexico	15	35,490
New Granada	42,820	49,605
Paraguay	80	.....
Prussia	1,307	.....
Spain	162,367	228,994
Sweden .....	.....	36,557
Switzerland	102	.....
West Indies .....	.....	264,240
United States	586,024	4,898,378
Total	\$9,087,894	\$16,880,377

2.—Principal Imports.

Silk goods	\$675,257
Linen goods	286,945
Cotton goods	2,760,300
Woolen goods	1,293,328
Jewelry	194,498
Wearing apparel	118,051
Furniture	249,372
Wood	227,503
Fruits	64,746
Provisions and spices	730,280
Wines and liquors	253,006
Sundries	2,234,608
Total value	\$9,087,894

3.—Principal Exports.

Cascarilla bark	\$66,542
Cochineal	14,437
Cotton	47,652
Hides	17,313
Guano	10,776,690
Wool	577,850
Gold	353,199
Silver	3,017,777
Saltpetre	1,483,820
Tobacco	135,551
Wines and liquors	4,226
Sundries	385,340
Total value	\$16,880,377

4.—Merchant Marine.

9 ships	3,194 tons.
10 barques	4,156 "
141 coasting vessels	14,705 "
Total (1852)	22,055 "

5.—Gold, Silver, Guano, and Saltpetre Exported.

To	Gold.	Silver.	Guano.	Saltpetre.
Bolivia	\$11,594	\$.....	\$.....	\$.....
Brasil	1,302	.....	.....	.....
Chile	10,200	37,310	.....	3,503
China	5,389	76,400	58,905	.....
Denmark .....	.....	.....	.....	14,000
England	245,295	2,172,336	5,017,860	802,023
Sweden	2,380	1,814	.....	.....
France	68,755	709,381	422,595	237,842
Germany .....	.....	.....	.....	27,281
Hamburg .....	.....	.....	.....	202,044
Holland .....	.....	.....	.....	24,500
Italy	2,552	346	35,280	22,225
Mauritius .....	.....	.....	80,055	.....
N. Granada .....	.....	600	.....	.....
Spain	5,712	10,946	184,095	28,241
Sweden .....	.....	.....	.....	36,557
United States .....	.....	8,644	4,713,660	85,204
West Indies .....	.....	.....	264,240	.....

Total - \$353,199 \$3,017,777 \$10,776,690 \$1,483,820

6.—Imports by Ports.

Callao	\$6,076,474
Arica	860,170
Islay	1,454,358
Huanchaco	235,745
San Jose	180,738
Paita	253,917
Loreto	26,494

Total value

7.—Commerce for Three Years.

	Imports.	Exports.
1851	\$9,447,465	\$13,085,715
1852	9,316,242	10,173,216
1853	9,087,897	16,880,377
	\$27,851,604	\$40,119,308
		27,851,604

In favor of Peru in 3 years

Or annually

8.—Commerce with United States.*

(According to U. S. Treasury Reports.)

	Imports.	Exports.
1849	\$446,953	\$111,236
1850	170,753	275,728
1851	94,733	272,098
1852	694,892	355,842
1853	173,441	697,577
1854	1,005,406	685,155
1855	597,618	870,546
1856	217,769	1,244,223
1857	208,747	507,932
1858	1,000,541	685,989

WEIGHTS, MEASURES AND MONEYS:

Old standards—Those of Spain.

New standards—Those of France.

The dollar of Peru=5 francs; the condor (gold)=10 dollars.

* Compare the values given by the U. S. and Peruvian returns severally for 1853-4. The variation is accounted for chiefly in the low price guano is entered in the United States.

ELEMENTARY STATISTICS OF EUROPEAN STATES.

No. 1.

EXTENT AND POPULATION.

States and Countries.	Extent in sq. miles.		Year of Return.	Population		Capital Cities and Population.	
	Districts.	Total.		Districts.	Total.		
Andorre		191	1858		8,132	Andorre	2,000
Anhalt-Bernburg		319	1855		53,475	Bernburg	6,772
Anhalt-Dessau-Roethen		599	"		114,851	Dessau	11,981
Austrian Empire		257,579	1854		39,411,309	Vienna	579,157
German Provinces	81,346		"	13,794,114		[Milan, 174,359; Prague, 118,- 405; Pesth, 106,379; Ve- nice, 106,353.]	
Galicia, Bukowina, etc.	34,257		"	5,487,311			
Hungary, Transylvania, etc.	124,424		"	14,626,411			
Lombardy and Venice	17,552		"	5,503,473			
Baden		5,916	1852		1,356,943	Carlsruhe	25,160
Bavaria		29,484	1855		4,541,556	Munich	132,112
Belgium		11,402	1856		4,529,460	Brussels	260,659
Bremen		74	1855		88,856	Bremen	60,087
Brunswick		1,427	1857		269,915	Brunswick	43,291
Denmark		22,036	1858		2,468,713	Copenhagen	143,591
Denmark Proper	14,790		"	1,499,850		[Schleswig, 12,097; Gluck- stadt, 6,219; Ratzeburg, 3,088.]	
Schleswig	3,548		"	395,860			
Holstein	3,294		"	523,528			
Lauenburg	404		"	49,475			
France		207,149	1856		36,039,364	Paris	1,178,262
Continental France	203,771		"	35,799,181		[Ajaccio, 11,944.]	
Island of Corsica	3,378		"	240,183			
Frankfurt		39	1855		74,784	Frankfurt	64,257
Gibraltar		6	1851		15,823	Gibraltar	15,823
Great Britain and Ireland		122,551	1857		28,560,203	London	2,616,248
England and Wales	58,320		"	19,304,019		[Merthyr-Tydvil, 63,080; Ed- inburg, 160,302; Dublin, 258,361; Castletown, 2,531; St. Peter's, 1,000; St. He- lier, 29,741.]	
Scotland	31,324		"	3,064,566			
Ireland	32,513		"	6,047,492			
Isle of Man	282		1851	52,387			
Guernsey	50		"	33,719			
Jersey	62		"	57,020			
Greece		19,031	1857		1,045,232	Athens	31,125
Hamburg		136	"		220,401	Hamburg	169,718
Hanover		14,846	1855		1,819,777	Hanover	42,484
Heligoland		5	1851		2,230		
Hesse-Cassel		3,740	1854		755,350	Cassel	32,516
Hesse-Darmstadt		3,245	1855		836,424	Darmstadt	29,766
Hesse-Homburg		106	"		24,937	Homburg	4,600
Holland		13,610	1858		3,523,823	The Hague	62,467
Holland Proper	12,620		"	3,328,795		[Amsterdam, 260,037; Rot- terdam, 103,322.]	
Luxemburg	990		"	195,028			
Ionian Islands		1,102	1856		226,824	Corfu	15,921
Lichtenstein		61	"		7,150	Lichtenstein	1,800
Lippe-Detmold		437	1855		105,490	Detmold	4,716
Lubeck		126	1857		55,423	Lubeck	30,717
Mechlenburg-Schwerin		5,187	"		439,231	Schwerin	17,336
Mechlenburg-Strelitz		1,051	1851		99,628	New-Strelitz	6,484
Maltese Islands		219	"		128,261	Valetta	59,822
Modena		2,336	1857		604,512	Modena	31,052
Monaco		58	1851		8,213	Monaco	1,200
Nassau		1,838	1857		434,064	Weisbaden	12,296
Oldenburg (with Kniphausen)		2,458	1855		287,163	Oldenburg	7,829
Parma		2,401	1857		499,835	Parma	44,758
Portugal		42,415	1854		3,844,119	Lisbon	260,000
Continental Portugal	35,253		"	3,505,129		[Oporto, 85,000; Funchall, 26,- 000; Braga, 20,000; Coim- bra and Evora, each 17,000.]	
Azores	5,546		"	231,910			
Madeira, etc.	1,616		"	107,088			
Prussia		108,004	1855		17,202,831	Berlin	451,871
Prussia Proper	107,552		"	17,137,765		[Breslau, 121,345; Cologne, 105,504; Konigsberg, 77,- 748; Danzig, 63,461; Mag- deburg, 71,549.]	
Hohenzollern	446		"	64,839			
Jahde	6		"	227			

TABLE OF EUROPEAN STATISTICS—CONTINUED.

States and Countries.	Extent in sq. miles.		Year of Return.	Population.		Capital Cities and Population.	
	Districts.	Total.		Districts.	Total.		
Reuss-Greizt .....	.....	144	1855	.....	39,397	Greitz..... 6,215	
Reuss-Schleitz .....	.....	448	"	.....	80,203	Schleitz	4,912
Roman States .....	.....	15,903	1857	.....	3,126,263	Roma	179,951
Russia in Europe .....	.....	2,134,126	1851	.....	60,122,617	St. Petersburg	532,241
Great Russia.....	890,412	.....	"	20,700,497	.....	Tula	54,626
Little Russia	80,896	.....	"	6,046,467	.....	Moscow	373,801
South Russia	175,639	.....	"	4,234,329	.....	Odessa	71,392
West Russia	162,122	.....	"	8,021,510	.....	.....	.....
Baltic Provinces	57,583	.....	"	2,216,936	.....	Riga	57,906
Finland	146,275	.....	"	1,660,763	.....	.....	.....
Kasan	239,367	.....	"	6,990,580	.....	.....	.....
Astrakan	332,294	.....	"	5,399,532	.....	.....	.....
Poland	49,538	.....	"	4,852,055	.....	Wilna	52,268
San Marino.....	.....	24	.....	.....	7,750	San Marino	1,250
Sardinia.....	.....	29,165	1857	.....	5,167,542	Turin	179,635
Piedmont.....	19,833	.....	"	4,590,260	.....	} [Genoa, 119,610.]	
Sardinia and Capraja	9,332	.....	"	577,282	.....	
Saxe-Altenburg .....	.....	510	1857	.....	133,593	Altenburg	16,811
Saxe-Cobourg-Gotha.....	.....	772	1855	.....	150,878	Coburg	12,122
Saxe-Meiningen .....	.....	972	1857	.....	165,682	Meiningen	6,497
Saxe-Weimar-Eisenach .....	.....	1,402	1855	.....	263,755	Weimar	12,271
Saxony .....	.....	5,776	"	.....	2,039,075	Dresden	108,732
Schaumburg-Lippe .....	.....	171	"	.....	29,848	Buckeburg	3,250
Schwartzburg-Rudolstadt .....	.....	371	"	.....	68,974	Rudolstadt	5,912
Schwartzburg-Sondershausen .....	.....	328	"	.....	61,452	Sondershausen	3,612
Spain .....	.....	182,713	1857	.....	16,301,851	Madrid	301,660
Continental Spain	177,736	.....	"	15,807,753	.....	} [Barcelona, 252,015; Seville, 152,000; Malaga, 113,050; Murcia, 109,446; Valencia, 145,512; Grenada, 100,678.]	
Balearic Isles	1,757	.....	"	266,952	.....	
Canary Isles	3,220	.....	"	227,146	.....	
Sweden and Norway .....	.....	293,327	1855	.....	5,131,656		
Sweden	170,099	.....	"	3,641,609	.....	Stockholm	100,040
Norway	123,228	.....	"	1,490,047	.....	Christiania	38,958
Switzerland .....	.....	15,272	1856	.....	2,392,740	Berne	26,340
Turkish or Ottoman Empire .....	.....	203,828	1850	.....	16,440,000	Constantinople	787,000
Turkey Proper.....	136,813	.....	"	12,130,000	.....	} [Adrianople, 120,000; Bucharest, 80,000; Salonica, 76,000; Scutari, 50,000; Bosnia, 70,000; Sofia, 50,000; Jassy, 50,000; Galatz, 25,000.]	
Wallachia	28,378	.....	"	1,800,000	.....	
Moldavia	15,696	.....	"	1,400,000	.....	
Servia	21,289	.....	1854	985,000	.....	
Montenegro	1,552	.....	"	125,000	.....	Florence	114,081
Tuscany .....	.....	8,553	1858	.....	1,793,967	Naples	413,920
Two Sicilies .....	.....	43,201	1856	.....	9,117,050	} [Palermo, 200,000.]	
Naples	32,621	.....	"	6,886,030	.....	
Sicily	10,580	.....	"	2,231,020	.....	Arolsen	2,000
Waldeck .....	.....	460	1855	.....	58,132	Stuttgart.....	46,507
Wurtemberg.....	.....	7,517	1856	.....	1,788,720	.....	.....
Grand total.....	.....	3,826,167	.....	.....	274,183,427	(R. S. FISHER.)	

ANNOTATIONS TO TABLE OF EUROPEAN STATES.

Races, Religions, etc.

Austrian Empire, by Races, in 1851.—Germany, 7,870,719; Slaves, 14,802,751; Italians, (Roumans), 8,051,906; Magyars, 4,866,556; and other races, 817,719—of which were Armenian, 15,996; Jews, 706,657; Bohemians, (gypsies,) 83,769, etc.

Austrian Empire, by Religions, in 1851.—Catholics, Roman, 25,509,626, and Greek, 3,505,668; Greek, (non-United,) 2,751,846; Protestants, of Augsburg, 1,213,897, and Reformed, 1,869,546; Unitarians, 46,278; other sects, 455; Jews, 853,304.

Russian Empire by Races, (including 5,060,768 in Asia, and 54,000 in America.)—Russians of Great Russia, 33,000,000; Russians of Little Russia, 11,200,000; Russians of South Russia, 3,600,000; Lithuanians and Poles, 7,000,000; Finns and Lapps, 3,300,000; Tartars and Moham-medans, 2,400,000; Germans, 600,000; Georgians and Armenians, 2,000,000; Jews, 1,500,000; Oural races, 600,000.

Russian Empire, by Religions, (other than the National or Greek non-United.)—Roman Catholic, 2,750,000; Armenian Catholic, 14,000; Greek-United, 380,000; Lutheran, 2,000,000; Mohammedan, 2,750,000; Jews, 1,250,000; Bhuddhist, 200,000.

Turkish Empire, by Races.—Ottomans, 2,300,000; Greeks, 1,200,000; Armenians, 400,000; Jews, 70,000; Slaves, 6,640,000; Roumans, 4,000,000; Albanians, 1,600,000; Tartars, 16,000; Gypsies, 214,000.

Turkish Empire, by Religions.—Mohammedan, 4,900,000; Greek, 10,700,000; Roman Catholic, 770,000; Jews, 70,000.

STATEMENT OF THE OPERATIONS OF THE RAILROADS OF MAINE FOR 1858.

	Length.	Cost.	Gross Receipts.	Current Expenses.	Net Receipts.	Aggregate of B. O. & M. for 5 yrs.	Receipts from Freight, etc.	Receipts from Miscellaneous.	Receipts from Miscellaneous.
Androscoggin	33	\$646,271	\$30,957	\$13,693	\$17,264	\$10,877	\$18,609	\$1,471	\$1,471
Androscoggin and Kennebec ..	55	2,210,947	279,149	133,255	145,894	144,308	118,273	16,568	16,568
Atlantic and St. Lawrence ..	149	7,077,379	545,791	395,567	150,224	144,871	380,155	18,785	18,785
Bangor, Oldtown and Millford ..	13	116,232	33,069	16,529	16,530	12,870	19,895	294	294
Cataus and Baring	6	224,000	28,383	15,984	12,399	1,697	25,676	1,010	1,010
Calais and Portland	72	2,871,264	165,074	94,328	70,746	87,591	54,977	22,506	22,506
Levee's Island	16	310,000	12,950	7,000	5,950	2,100	10,550	.....	.....
Penobscot and Kennebec	55	1,874,831	Run by the Androscoggin and Kennebec Railroad.	.....	.....	.....	.....	.....	.....
Portland, Saco and Portsmouth ..	51	1,560,000	211,997	110,488	101,499	155,954	48,029	8,014	8,014
Somerset and Kennebec	37	783,763	60,000	30,000	20,000	25,000	.....	.....	.....
York and Cumberland	20	398,000	30,524	24,519	6,005	13,817	15,907	907	907
Total	507	\$18,070,667	\$1,387,884	\$841,369	\$546,515	\$620,085	\$667,376	\$69,420	\$69,420

RAILROADS OF MAINE.

Subjoined is a statement—

Showing the cost, earnings, etc., of the Maine Railroads, from the opening of the Bangor, Oldtown and Milford Railroad, in 1836, to the present time.

Year.	Length.	Cost.	Gross Receipts.	Current Expenses.	Net Receipts.	Aggregate of B. O. & M. for 5 yrs.	Receipts from Freight, etc.	Receipts from Miscellaneous.	Receipts from Miscellaneous.
1836-1842	60	\$1,794,739	\$86,217	\$65,829	\$20,388	\$25,614	\$1,885	\$2,820	\$2,820
1843	63	1,426,933	47,918	34,900	13,018	84,926	10,957	9,062	9,062
1844	63	1,537,722	124,842	60,176	64,666	106,137	18,138	7,128	7,128
1845	63	1,616,469	150,180	64,131	86,049	181,377	18,603	6,702	6,702
1846	63	1,628,739	150,248	70,109	80,139	98,991	19,157	8,574	8,574
1847	63	1,639,556	173,209	72,723	100,486	120,454	20,891	10,568	10,568
1848	63	1,406,824	194,635	78,842	115,793	129,344	20,891	10,568	10,568
1849	111	2,927,091	293,799	124,319	169,480	190,707	62,300	10,410	10,410
1850	111	3,070,864	361,981	149,912	212,069	234,899	82,903	18,629	18,629
1851	254	8,219,648	671,204	270,565	300,639	265,170	178,047	27,987	27,987
1852	349	11,188,350	711,459	340,770	370,689	428,980	247,468	36,010	36,010
1853	395	12,998,056	963,415	467,329	496,087	515,775	361,039	46,234	46,234
1854	385	13,626,760	1,236,037	658,401	577,636	635,688	543,137	86,213	86,213
1855	385	14,064,040	1,385,616	817,697	570,919	677,326	662,580	66,403	66,403
1856	460	16,865,303	1,524,960	997,187	527,773	736,671	724,367	63,922	63,922
1857	478	17,077,546	1,423,251	959,389	463,862	653,588	720,757	54,636	54,636
1858	507	18,070,667	1,387,884	841,369	546,515	620,085	667,376	69,420	69,420
Total	507	\$129,151,337	\$10,795,861	\$6,073,643	\$4,722,218	\$5,513,368	\$4,239,506	\$467,718	\$467,718

The aggregate result of the operation of the railroads of the State since the opening of the first road in 1837, is fully shown in the condensed statement. Their total aggregate cost, (that of the several years being added together)—\$129,151,337. Gross earnings, \$10,795,861; current expenses, \$6,073,643; net earnings, \$4,722,218.

The general result is not a favorable one. The per centage of gross earnings to capital invested, has been at the rate of $8\frac{1}{2}$ per cent.—net do., at the rate of $3\frac{3}{4}$ per cent. The large addition, from earnings, to construction, by some of the roads, particularly by the Atlantic and St. Lawrence, is one reason for the comparatively small ratio of *net* earnings.

All the railroads of Maine, with the exception of the Atlantic and St. Lawrence, have a very light traffic in *freight*, owing to the almost unrivalled facilities for communication by water which the State possesses.

The dividends on the Atlantic and St. Lawrence Railroad have been paid by the Grand Trunk, of Canada, under an agreement between two companies.

ON THE MANNER OF TAKING A CENSUS.

*To the Committee of Publication
of the Am. Geo. and Stat. Society:*

GENTLEMEN—In a former communication, I noticed some of the difficulties in the way of obtaining full and accurate census returns, as encountered in the persons employed upon the service. Allow me in this, to examine some of the obstacles that will be met among the people themselves, from whom the primary facts are to be obtained, and upon the precision of which everything else depends.

First, because greatest, I will name *ignorance*, as an obstacle to satisfactory returns, which can only be overcome by promoting general intelligence, and especially by diffusing correct notions of the purposes and wants of this great national inquiry. I use this term in the general way, to express a want of information upon the particular points that require specific answers, and which are to be represented by definite figures as the basis of general deductions.

There is generally much more precision with regard to the returns of the personal census, than those of agriculture, manufactures, and other collateral inquiries; and as returned in 1855, I am convinced that in an exceedingly

large proportion of cases, these statistics were strictly correct. Whatever apprehensions the unenlightened portions of the public may have, of some sinister motive on the part of government, with regard to establishing a basis for taxation, there can scarcely be found a person, however ignorant, who has had the slightest acquaintance with our institutions, that would entertain a suspicion that a tax or other burden was to grow out of the personal inquiries of the census, or who could not have known from his own observation, that taxes upon the person, except for highway labor, and a few minor objects in some States, are unknown among us. The fear of military conscription prevented a few newly arrived emigrants from giving freely the required answers to the interrogatories; and strange as it may appear, the dread of pestilence, like that which visited the Israelites after the census ordered by David, still finds place in the minds of the superstitious.* These objections are, however, so rare that they become curiosities, rather than difficulties requiring special effort for removal. Whatever defects the census may show with regard to personal statistics, they must therefore be mainly attributed to other causes than unwillingness on the part of those giving in the returns. The number of persons whose ages were not given in years or months, according to the instructions, in 1855, in New York State, was less than a fifth of one per cent.; and those whose place of birth was unknown, were less than half of one per cent. of the total population. The principal defects in these cases, probably arose in most instances from the answers being given by other persons than those to whom they related.

Statistics of agriculture and manufactures, when returned with the utmost good faith by the proper persons for giving them, must often be widely variant from facts, on account of the absence of data for correct returns. When we reflect that farmers seldom survey the fields devoted to particular crops, or weigh the hay

* II Samuel, xxiv, 15.

fed upon their farms, or measure the supplies consumed in their families, or the roots and grains fed to their stock, we must be prepared to find the census returns of these items founded upon estimates more or less approaching the truth, according to the soundness of judgment or systematic habits of the person answering the inquiries. Manufactures conducted methodically, and limited to the consumption of a few kinds of material, and the yielding of few kinds of product, are liable to but few difficulties in obtaining their statistics, the principal of which arises from the fact that the inquiries are made at a season of the year when the accounts are not posted up. The period which they embrace, extending through parts of two years, renders comparison with statistics for the civil year inconvenient and liable to error. The greatest difficulty incident to the procuring of manufacturing statistics, arises from the mixed and complicated character of the business, which may in one place embrace many distinct pursuits that elsewhere are reported separately. A furnace for reducing iron from the ore, may, for example, be connected with an iron foundry, smith shops, machine shops for working wood and metals, and the manufacture of a great variety of articles, which, as they are conducted together, will defy the most patient attempts at analysis, in assigning to each its due proportion of labor and capital. For this difficulty there can scarcely be hoped a remedy, and the science of statistics must, in many cases, be content with a general statement of values, and a very comprehensive plan of classification.

Inquiries of a historical character have been in some census schedules, but generally without satisfactory result. However desirable it might be to ascertain the date of establishment on a general retrospect of operations, this information often requires an amount of investigation or a search after absent records, that must be left to the local historian, rather than be imposed upon the Census Marshal. Of a still more objectionable and wholly impracticable character, would be inquiries implying professional education or special qualifications, such

as those relating to geology or natural history, which, to be worth anything, must be obtained by skillful persons, carefully instructed and generally familiar with the subject. There is constantly a tendency to the introduction of special inquiries into the census, to supply information that may interest a small class, but would prove of little general utility.* They may perhaps, of themselves, be important, but in general, should be ascertained by investigations made for the particular purpose, by those whom they especially concern.

Respectfully yours, .

FRANKLIN B. HOUGH.

ALBANY, March 8, 1859.

RUSSIAN AMERICA.

	1854.	1855.
Revenue—Products from sale of furs	\$568,563	\$564,689
“ “ other articles	258,415	268,060
Total	\$826,978	\$832,749
Expenses of administration in Russia and the colonies.....	\$400,362	\$424,435
Assurances, cost of freights and duties paid	277,759	259,457
Total	\$678,121	\$683,892
Russian population, Jan. 1, 1856.....	9,725	

SURINAM AND THE DUTCH WEST INDIES.

In 1854 the population of Surinam consisted of:—

Free.....	13,793	viz.,	Males, 6,990	Females, 6,803
Slave.....	38,545	“	18,313	“ 20,232
Total..	52,338	“	25,303	“ 27,035

and contained 256 plantations, on which were residing 924 free, and 32,524 slave persons. Of these 91 were sugar, 52 coffee, 15 coffee and cocoa, and 32 cotton plantations.

The sugar exports were, in the year named: to the Netherlands, 22,055,108 lbs.; to North America, 4,654,276 lbs.; and to other places, 6,376,634 lbs.—total, 33,083,018 lbs., valued at 2,333,763 gulden. The molasses exported was:

* In preparing the schedules for the New York State Census of 1855, the Secretary of State received suggestions in some instances strikingly illustrative of the above statement. One correspondent wished inquiries about the kind and quantity of timber; another, the number of sheep slain by dogs, and others, subjects quite as foreign as these to the legitimate objects of the census.

to North America, 672,919; and to other places, 277,193—total 950,112 gallons, valued at 190,022 gulden. The rum exported amounted to 94,408 gallons, valued at 57,424 gulden; coffee, 66,618 lbs., 140,553 gulden; cocoa, 194,254 lbs., 33,719 gulden; and cotton, 677,705 lbs., 219,036 gulden.

The population of the Dutch West India Islands in the same year was as follows:

Islands.	Free.	Slaves.	Total.
Curacoa	11,413	5,418	16,831
Bonaire	1,570	769	2,339
Aruba	2,635	566	3,201
St. Martin (part)	1,300	1,618	2,918
St. Eustache	785	1,071	1,856
Saba	1,060	649	1,709
Total	19,763	10,091	29,854

—or, according to religious faith, as follows:

Islands.	Protestant.	Catholic.	Jewish.
Curacoa	1,922	14,123	786
Bonaire	120	2,218	1
Aruba	428	2,772	1
St. Martin	1,187	100	2
St. Eustache	1,623	230	3
Saba	1,682	27	..
Total	6,962	19,470	793

RAILROADS OF NEW HAMPSHIRE.

Subjoined is a statement of the cost, earnings, etc., of the railroads of New Hampshire, from the opening of the Concord Railroad in 1842, to the present time. It presents a complete summary of the operation of all the railroads in the State, for a period of 16 years. The railroads running into this State, but lying chiefly in other States, are not included—an account of these more properly coming under a description of railroads of other States.

The total aggregate expenditure upon all the railroads in the State at the date of the annual report of the Railroad Commissioners in June last, adding together that for the several years, has been \$158,412,974. The total gross earnings have been, \$16,631,301; the current expenses, \$9,367,459; net earnings, \$7,260,269. Receipts from passengers, \$6,176,991; receipts from freight, \$9,284,760; receipts from mails, etc., \$563,050.

The rate of gross earnings to cost has been about 11 per cent.; net, was nearly 5 per cent. A better result would have been shown, had the railroads lying partially in the State, such

as the Nashua and Lowell, and Boston and Maine, been included. The reason why so few dividends have been paid, has been due to the embarrassed state of the finances of the companies, rather than to a lack of earnings.

RECAPITULATION

Showing the cost, earnings, etc., of the New Hampshire Railroads, from the opening of the Concord Railroad to the present time.

Year.	Length.	Cost.	Gross Receipts.	Current Expenses.	Net Receipts.	Receipts from Passengers.	Receipts from Freight.	Receipts from Miscellaneous.
1843	35	\$725,059	\$70,912	\$27,184	\$43,728	\$48,034	\$21,808	\$1,068
1844	35	742,223	138,080	65,167	73,913	72,799	66,420	860
1845	35	786,444	181,842	82,929	98,913	90,545	90,099	1,166
1846	35	779,581	228,479	136,056	93,424	109,971	116,469	3,038
1847	35	1,042,718	290,228	175,453	113,774	133,544	141,117	15,668
1848	159	4,819,771	494,020	280,143	229,877	218,201	280,780	16,078
1849	171	6,764,402	776,932	316,194	416,738	321,200	429,769	17,972
1850	320	10,802,640	1,114,160	663,896	550,449	497,153	677,019	38,980
1851	393	12,463,732	1,117,342	658,463	662,074	602,227	665,252	49,164
1852	440	14,262,832	1,307,123	656,476	650,645	639,920	690,746	44,964
1853	487	16,242,119	1,600,869	869,492	741,366	610,030	906,077	54,348
1854	531	17,064,659	1,873,140	1,089,584	827,114	677,129	1,082,915	60,181
1855	532	17,854,792	2,044,716	1,194,108	860,693	660,266	1,180,515	62,767
1856	538	18,206,116	2,009,009	1,301,302	707,699	624,942	1,163,662	66,838
1857	539	18,444,634	1,709,776	1,079,776	637,696	524,749	990,583	54,718
1858	539	17,431,961	1,672,152	1,001,237	683,065	547,280	1,004,529	75,360
4,825		\$158,412,974	\$16,631,301	\$9,367,459	\$7,260,269	\$6,176,991	\$9,284,760	\$563,050

COAL MINES OF NEW SOUTH WALES.

The production from 10 mines in 1851 was 67,610, and in 1852, 67,404 tons; from 13 mines in 1853, 96,809; from 12 mines in 1854, 116,642; and from 14 mines in 1855, 137,076 tons.

TURK'S ISLAND.

SALT EXPORTED.

Year.	Tons.	Value.
1849.....	1,407,722 bushels.	
1850.....	1,169,402 "	
1851.....	286,422 "	
1852.....	1,061,776 "	
1853.....	827,808 "	
1854.....	1,021,900 "	
1855.....	391,584 "	
1856.....	674,940 "	

Tons.

1856—Exp's. £27,064	Cleared. 26,603	Exp. duty. £703
Imp's. 33,523	Entered 28,006	Imp. " 3,892
	Other	1,211

£5,806

Expenditures £6,124

COMMERCE OF HUDSON'S BAY TERRITORY.

Value of exports from H. B. Territory, in 1854, £209,914; in 1855, £198,626; and in 1856, £318,554. Value of imports from Great Britain in 1854, £102,784; in 1855, \$82,963; and in 1856, £110,049; and from colonial possessions in 1854, £9,922; in 1855, £10,645; and in 1856, £15,921.

COMMERCE OF THE NEW YORK CANALS.

Subjoined will be found a series of tabular statements, prepared by the Auditor of the Canal Department, showing the total tonnage of all the property on the canals, ascending and descending, its value, and the amount of tolls collected for the twenty-three years preceding:

Year.	Tons.	Value.	Tolls.
1836.....	1,310,807	\$67,634,343	\$1,614,342
1837.....	1,171,276	55,809,288	1,292,623
1838.....	1,333,011	65,746,559	1,590,911
1839.....	1,435,713	73,390,764	1,616,382
1840.....	1,416,046	66,303,892	1,775,747
1841.....	1,521,661	92,202,929	2,084,582
1842.....	1,236,931	60,016,608	1,749,196
1843.....	1,513,439	76,276,909	2,081,590
1844.....	1,816,586	90,921,152	2,446,374
1845.....	1,985,011	100,553,245	2,646,181
1846.....	2,268,662	115,612,109	2,756,106
1847.....	2,869,810	151,563,428	3,635,381
1848.....	2,796,230	140,086,157	3,252,211
1849.....	2,694,732	144,732,285	3,268,226
1850.....	3,076,617	156,397,929	3,273,899
1851.....	3,582,733	159,981,801	3,329,727
1852.....	3,863,441	196,603,517	3,118,244
1853.....	4,247,852	207,179,570	3,204,718
1854.....	4,165,662	210,284,312	2,773,566
1855.....	4,022,617	204,390,147	2,805,077
1856.....	4,116,082	218,327,062	2,748,203
1857.....	3,344,061	136,997,018	2,045,641
1858.....	3,665,192	138,568,844	2,110,754

The total tons coming to tide-water from Erie and Champlain canals for each of the last twen-

ty-five years, and the aggregate value thereof in market, was as follows:

Year.	Tons.	Value.
1834.....	553,596	\$13,405,022
1835.....	753,191	20,525,446
1836.....	696,374	26,932,470
1837.....	611,781	21,822,354
1838.....	640,481	23,038,510
1839.....	602,128	20,163,109
1840.....	669,012	29,213,573
1841.....	774,334	27,225,322
1842.....	666,626	22,751,013
1843.....	836,861	28,453,408
1844.....	1,019,094	34,183,167
1845.....	1,204,943	45,452,321
1846.....	1,362,319	51,105,256
1847.....	1,744,283	73,092,414
1848.....	1,447,905	50,883,907
1849.....	1,579,946	52,375,521
1850.....	2,033,863	55,474,637
1851.....	1,977,151	53,927,508
1852.....	2,234,822	66,893,102
1853.....	2,505,797	73,688,044
1854.....	2,223,743	72,120,691
1855.....	1,895,593	74,377,937
1856.....	2,123,469	74,286,734
1857.....	1,617,187	51,190,018
1858.....	1,985,142	61,536,061

The following table shows how much of the tolls received in each year of navigation was on "products from Western States," how much was on "products of this State," and how much was on "merchandise going from tide-water."

Year.	Tolls on agricultural and other products.		Merchandise from tide-water.	Total on all canals.
	From other States.	From this State.		
1836.....	\$153,063	\$884,049	\$510,997	\$1,548,109
1836.....	211,750	863,022	549,564	1,614,336
1837.....	160,116	723,756	408,751	1,292,623
1837.....	247,241	804,967	539,703	1,590,911
1839.....	310,072	756,723	549,587	1,616,382
1840.....	427,480	865,758	482,510	1,775,778
1841.....	500,630	924,326	609,927	2,034,883
1842.....	467,792	827,841	453,566	1,749,198
1843.....	623,297	892,151	566,142	2,081,590
1844.....	676,032	1,088,274	682,068	2,446,374
1845.....	677,922	1,240,678	727,582	2,646,182
1846.....	1,013,478	1,100,699	641,929	2,756,106
1847.....	1,583,500	1,213,761	837,943	3,635,204
1848.....	1,157,905	1,213,060	891,407	3,262,367
1849.....	1,101,860	1,261,229	905,137	3,268,226
1850.....	1,137,731	1,222,877	913,291	3,273,899
1851.....	1,251,390	1,027,124	1,051,213	3,329,727
1852.....	1,304,018	1,013,990	799,650	3,118,244
1853.....	1,383,422	946,968	975,328	3,204,718
1854.....	985,647	1,007,847	780,072	2,773,566
1855.....	1,148,098	857,359	799,620	2,805,077
1856.....	1,247,765	743,668	756,770	2,748,203
1857.....	899,380	674,057	472,204	2,045,641
1858.....	944,109	888,259	278,386	2,110,754

The whole quantity of wheat and flour which came to the Hudson River, from 1834 to 1858, inclusive, with the aggregate market value of the same, and the amount of tolls received on all the wheat and flour transported on the canals in each year, from 1837 to 1858, inclusive, is as follows:

Year.	Tons.	Value.	Tolls.
1834.....	130,452	\$5,712,795	Not ascer'd.
1835.....	128,552	7,395,939	do
1836.....	124,982	9,796,540	do
1837.....	116,491	9,640,156	\$301,739
1838.....	133,080	9,833,556	380,161
1839.....	124,683	7,217,841	404,525
1840.....	244,862	10,362,862	700,071
1841.....	201,360	10,165,355	921,046
1842.....	198,231	9,284,778	606,727
1843.....	248,780	10,283,454	731,816
1844.....	277,865	11,211,677	816,711
1845.....	320,463	15,962,950	851,533
1846.....	410,366	18,836,412	1,099,325
1847.....	551,205	32,890,936	1,460,424
1848.....	431,641	21,148,421	1,126,133
1849.....	434,444	19,308,595	1,128,064
1850.....	461,781	20,218,188	1,114,519
1851.....	457,624	16,487,652	867,881
1852.....	576,772	22,564,256	995,160
1853.....	618,858	30,034,571	998,962
1854.....	240,655	18,482,377	363,763
1855.....	301,125	23,163,681	548,946
1856.....	475,365	29,096,973	709,640
1857.....	263,141	14,043,581	456,350
1858.....	454,831	19,632,087	529,254

CONSUMPTION OF COTTON IN EUROPE.

The average weekly consumption of cotton in Europe, according to Ellison's "Hand-Book of the Cotton Trade," amounted, in 1854, to 47,277 bales, and in 1857, to 63,530, but in 1856 the consumption averaged 71,043 bales, the highest rate ever before attained. The increase in the 8 years ending with 1857, over the consumption of 1850, was thus: 16,253 bales, or 34.4 per cent.; and the increase from the lowest to the highest rate, 23,765 bales, or 50.3 per cent. The statistics of consumption for the years severally, distinguishing that of the United Kingdom and of the Continent, are—

	United Kingdom.	Continent.	Total.
1850.....	29,125	18,152	47,277
1851.....	31,988	18,939	50,927
1852.....	35,790	25,437	61,227
1853.....	36,613	23,093	59,706
1854.....	37,829	22,440	60,269
1855.....	40,403	23,535	63,938
1856.....	41,987	29,055	71,042
1857.....	39,065	24,465	63,530
1858.....	41,333	.....	.....

And if the consumption on the continent in 1858 has been in proportion to that of the United Kingdom in that year, the total will have been about 70,000 bales.

The weekly consumption in the countries of

Continental Europe, for the year 1850, and the seven subsequent years ending with 1857, has been annually as follows:

France—7,077, 7,173, 10,575, 9,018, 8,500, 9,211, 10,115, 8,596 bales.

Belgium—1,134, 1,115, 1,634, 1,538, 1,346, 1,211, 1,533, 1,096 bales.

Holland—1,038, 1,038, 1,365, 1,173, 1,653, 1,711, 1,903, 1,883 bales.

Germany—1,653, 2,115, 2,442, 2,769, 3,981, 4,057, 4,750, 4,142 bales.

Trieste—2,282, 2,211, 2,596, 1,981, 1,788, 1,653, 1,865, 1,442 bales.

Genoa, Naples, etc.—558, 596, 942, 980, 807, 1,096, 2,115, 1,730 bales.

Spain—1,481, 1,768, 1,826, 1,634, 1,788, 2,192, 2,346, 1,730 bales.

Russia, Norway, etc.—2,923, 2,923, 4,057, 4,000, 2,577, 2,404, 4,423, 3,846 bales.

The total annual consumption in Europe for the eight years embraced; the exports of cotton from the United States for the same years, and the total that must have been supplied from other sources than the United States—are shown in the annexed table:

Years.	Total Consumption.	Supplied by the U. States.*	Supplied from other Sources.
1850.....	2,458,404	1,444,049	1,014,355
1851.....	2,648,204	2,093,720	554,484
1852.....	3,183,804	2,484,615	699,189
1853.....	3,104,712	2,526,296	578,412
1854.....	3,133,988	2,245,075	888,913
1855.....	3,324,776	2,303,403	1,021,373
1856.....	3,694,184	2,991,175	703,009
1857.....	3,303,560	2,265,588	1,037,972

From this table it would appear that in the eight years employed in illustration, the average annual consumption in Europe is 3,106,454 bales; the average annual supply from the United States, 2,294,240 bales; and the average annual supply from all other sources, 812,214 bales.

Among the sources other than the United States, the most important is British India. In 1840 the latter country supplied to the United Kingdom 77,011,839 pounds of cotton, but in 1857 not less than 250,338,144. This shows an increased production between the two periods of 225 per cent. In the same 18 years the exports of cotton from the United States has risen from 743,941,061 pounds, to 1,048,282,475 pounds, or 40.9 per cent. Thus it appears that the rate of increase in India has been six times as great as in the United States.

* In reducing the quantity to bales, in the first 5 years, the pounds are divided by 440, which has been considered as a fair average. The three last years are official.

DEPARTMENT OF PUBLICATIONS.

BOOKS, MAPS AND CHARTS, ETC.,

Purchased or donated since last Report.

Acknowledgements of all donations to the Library will be made in the number of the JOURNAL, issued next after they have been received and entered.

The friends of the Society, and all desirous of facilitating the study of Geography and Statistics, are respectfully urged to send to the Library Rooms (Clinton Hall, Astor Place,) donations of books, atlases, maps and charts, whether ancient or modern, connected with these pursuits.

It is also important that the Society should possess a complete collection of all existing text-books in Geography, and its cognate sciences; and the publishers of such works are requested to send copies thereof, so as to create a department of the Library for the special use and reference of teachers and others interested in educational matters.

WESTERN STATES—(*Presented by Hon. Charles P. Daly.*)

—Statistics of the West at the close of 1836. By James Hall. Cincinnati, 1837. 1 vol., 12mo., pp. 284.

NEW YORK STATE DOCUMENTS—(*Presented by Hon. Joseph B. Varnum.*)

—Senate Journal, 1849 and '50. 2 vols., 8vo.

—Assembly Journal, 1849 and '50. 3 vols., 8vo.

—Senate Documents, 1849 and '50. 6 vols., 8vo.

—Assembly Documents, 1849 and '50. 12 vols., 8vo.

—Second Report on the Code. 1 vol., 8vo.

PUBLIC DOCUMENTS—(*Presented by Hon. F. E. Spinner.*)

—Report on Finance, 1858. 1 vol., 8vo.

—Smithsonian Report, 1857. 1 vol., 8vo.

—Mortality Statistics: Census, 1850. 1 vol., 8vo.

—Patent Office Report, 1857. 4 vols., 8vo.

SURVEYS, ETC.—(*Presented by H. V. Poor, Esq.*)

—Memoir on Recent Surveys, Observations and Internal Improvements in the United States, etc. By H. S. Tanner. Philadelphia, 1830. 1 vol., 12mo., pp. 108.

MISSISSIPPI—(*Presented by His Excellency, Wm. McWillie, Governor of the State of Mississippi.*)

—Report of the Auditor of Public Accounts to the Legislature of the State for 1858. 1 vol., 8vo., pp. 452.

—Report on the Agriculture and Geology of Mississippi. By B. L. C. Wailes. 1854. 1 vol., 8vo., pp. 371.

—Preliminary Report on the Geology and Agriculture of the State of Mississippi. By L. Harper, L.L.D., 1857. 1 vol., 8vo., pp. 350.

PINKERTON'S VOYAGES—(*Presented by Samuel Davis, Esq.*)

—Pinkerton's Voyages. Vols. 1, 2, 3 and 4. (Philadelphia Edition.) 4to.

PUBLIC DOCUMENTS—(*Presented by Hon. George Taylor.*)

—Report on Finance, 1857-'58. (10 copies.)

—Commerce and Navigation, 1857-'58. (10 copies.)

PUBLIC DOCUMENTS—(*Presented by Hon. James L. Orr.*)

—Report on Finance for 1857-'58.

—Commerce and Navigation for 1857-'58.

PUBLIC DOCUMENTS—(*Presented by the Hon. Preston King, U. S. Sen.*)

—Patent Office Report for 1858. 4 vols., 8vo.

—Commerce and Navigation. 1 vol., 8vo. (2 copies.)

—Coast Survey for 1856. 1 vol., 4to.

—Report on Consumption of Cotton in Europe. 1 pamph., 8vo.

—Report on Finance. 1 vol., 8vo.

NEW YORK STATE DOCUMENTS—(*Presented by Hon. J. W. Chanler.*)

—Transactions of the American Institute for 1857. 1 vol., 8vo., pp. 719.

—Transactions of the N. Y. Agric. Society. Vol. xvii, 1857. 8vo., pp. 814.

—Transactions of the Medical Society for 1858. 1 vol., 8vo., pp. 655.

—Report of Prof. A. D. Bache relative to the N. Y. Harbor Coast Survey. Albany, 1858. With chart. 8vo. pamph., pp. 12.

—Communication from the Governor, transmitting Report of the Commissioners appointed to secure the Establishment, Government, etc., of Common Schools in the city of New York, 1858. 1 vol., 8vo., pp. 1, 192.

—Eleventh Annual Report of the Regents of the University, (on the Cabinet of Nat. Hist.) Albany, 1858. 1 vol., 8vo., pp. 44.

—Commissary General: Report for 1858. 1 vol., 8vo., pp. 128.

—Statistics of the Poor for 1858. 1 vol., 8vo., pp. 45.

—State Engineer and Surveyor's Report for 1857. 1 vol., 8vo., pp. 192.

—First Report of the Commissioners of the Code. 1 vol. pamph., 8vo., pp. 116.

—State Engineer and Surveyor on Railroads: Report for 1858. 1 vol., (pamph.) 8vo., pp. 312.

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JOURNAL

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No. 5.

PROCEEDINGS.

NINTH MEETING, April 14th, 1859. In the absence of the President, Frederick Prime, Esq., in the Chair.

On motion, the ordinary business of the Society, except the admission of new members, was suspended.

Marcus J. Boorman, Walter Underhill, Robert Ray, Jr., A. P. Robinson, Augustus F. Dow, Manton Marble, Edward Dickenson, John T. Doyle, Hon. James I. Roosevelt, Alfred W. Craven, C. E., John B. Holmes, Rev. J. W. Cumming, D. D., Charles M. Leupp, George T. Strong, F. H. Gerdes, Isaac Bernheimer, Benjamin M. Stilwell, and Francis W. Worth, were elected as Resident Members.

Hon. James Dixon, U. S. Senator, (Conn.); Edward D. Mansfield, Commissioner of Statistics, for the State of Ohio; and Washington A. Bartlett, late of the U. S. Coast Survey, were elected Corresponding Members.

John McLeod Murphy, Esq., read a paper on the "*Isthmus of Tehuantepec; its Inhabitants and Resources.*" The thanks of the Society were tendered to Mr. Murphy for his Address, and a copy requested for the Archives of the Society.

Before adjournment, Mr. Murphy took occasion to present to the Society, on behalf of His Excellency, Porfirio Diaz, Jefe Politico of Tehuantepec, a map of the State of Oaxaca, for which the thanks of the Society were directed to be returned. *Adjourned.*

DEPARTMENT OF GEOGRAPHY

MICRONESIA.

THE RUINS ON PONAPE, OR ASCENSION ISLAND.*

[Dr. Latham, in his "Man and His Migrations," makes the following supposition: "If the inhabited world were one large circular island; if its population were admitted to have been diffused over its surface from some single point, and if that single point were at the same time unascertained and requiring investigation, what would be the method of our inquiries? We should ask what point would give us the existing phenomena with the least amount of migration; and we should ask this upon the simple principle of not multiplying causes unnecessarily. The answer would be—the center. From the center we can people the parts about the circumference without making any line of migration longer than half a diameter; and without supposing any one of such numerous lines to be longer than the other."]

Taking the center as it is, Dr. Latham selects six extreme points as starting places, and from there traces back the lines of migration, by physical affinities, and affinities of language, toward a common center. These six points are Terra del Fuego, Van Dieman's Land, Easter Island, which is the farthest extremity of Polynesia, Cape of Good Hope, England, and Ireland.

Of course this is pure hypothesis, and I do not quote it as having any scientific value. But it is curious that the common center of these various lines would be "somewhere in intra-tropical Asia"—near the spot toward which history and tradition point as the seat of the common origin of the human race.

Dr. Latham's imaginary line from Easter Island, runs through the Caroline and Pelew groups, to the Phillipines, and thence to the south-eastern portion of the Asiatic Continent, on the Indo-Chinese Peninsula; i. e., he supposes that the Caroline Islands were peopled from the Malayan Peninsula, by way of the Phillipines.

Pickering makes a suggestion regarding waves of

* An Address by L. H. Gulick, M. D., of Micronesia, read by Rev. Jos. P. Thompson, D. D., before the American Geographical and Statistical Society on the 18th December, 1856.

migration, which may help to elucidate the difference of social culture between the islands and the main land. He says, "If the human family has had a central origin, and has gradually and regularly diffused itself, followed by the principal inventions and discoveries, the history of man would then be inscribed on the globe itself; and each new revolution obliterating more or less of the preceding, his primitive condition should be found at the furthest remove from the geographic center; as, in the case of a pebble dropped into the water, the earliest wave keeps most distant from the point of origin." (p. 291.) Our own pioneer emigration illustrates this.

As yet our data are too imperfect to warrant us in forming a theory as to the origin of Micronesians. The missionaries at the Carolines are reducing the native dialects to a written form, and will soon present us a comparative grammar, with Polynesian and Asiatic affinities. Dr. Gulick is investigating physiological characteristics, traditions, and monumental remains. Thus, while imparting a Christian civilization, they will aid the civilized world in solving great problems of history.—*Editors.*]

Ascension Island, of the Pacific Ocean, called by the native inhabitants, Ponape, is situated in lat. $6^{\circ} 55' N.$, and long. $158^{\circ} 25' E.$ It is peopled by a race that no doubt migrated from the west, and most probably from the Philippine Islands. Its language has many close relations to that spoken in the western part of the Caroline range, which has been distinctly traced to the Tagala of the Philippine Archipelago. The island consists of a coral reef about eighty miles in circumference, enclosing several basaltic islands, one of which is perhaps sixty miles in circumference, and gives name to the whole group.

A thorough description and discussion of the ruins on Ascension Island, will throw much light on those similar structures that have been slightly noticed on various Micronesian Islands, and that will no doubt yet be found more widely diffused on all the high islands, and more interesting than has yet been imagined.

A DESCRIPTION OF THE RUINS.

The whole main island, and even the lesser ones of the slightest moment, may be said to be covered with curious stone structures, that are conveniently termed ruins, though it should not be inferred that they are necessarily in a ruinous condition. It is difficult to walk a mile, or even half that distance, in any direction, without encountering these remains of

ancient labor. They are to be found in all possible locations—along the ocean shore, and miles inland—on hills of commanding height, and in secluded vallies—on level plats, and on steep hill slopes. They are of various ages, as may be inferred from their being found in every degree of preservation, and from the varying growths of vegetation in and upon them.

A few of these ancient wonders are of earth, and these are to be found in two or three of the open spaces in the forests, where nothing grows but a short grass and a few stunted Pandanus shrubs. They consist of long, narrow mounds, from eight to ten feet in height, and about fifteen feet wide at the base.

By far the greater number, however, of these structures, are of stone; and these are of several kinds.

1. A heterogeneous class, which it is difficult to designate. Sometimes they are mere lines of stones, with no definite commencement or termination; formed often, perhaps usually, of the very largest kind of movable rocks; and of very varying heights. Sometimes, as at the mouth of the Ronkiti stream, they appear like an embankment for a road along the shore. In several of the excessively rocky parts, as on the eastern slopes of the Jekoits Island, large bodies of stone are piled up in every imaginable arrangement, forming long walks, embankments, solid squares, and irregular enclosures.

2. Scattered over every portion of the island, with the possible exception of only the mountainous central peaks, are walls arranged in squares or parallelograms, sometimes a wall within a wall, and often enclosing a pile of well laid stone, in which a small vault may generally be found.

These squares are of every size, from two or three yards, to ten or fifteen rods. The walls are of all heights, sometimes scarcely more than a continuous line of stones, and sometimes five or six feet high; and in one noted case, (that shall be particularly described in connection with the next class of structures,) they are more than twenty feet in height. The thickness of the walls varies proportionably

with the height, from two or three, to ten feet. The materials are principally irregular basaltic rocks, occasionally basaltic prisms intermixed, and oft times coral stones fill up the interstices. In some few instances an outer wall encloses an inner. If the walls be of considerable height, an entrance four or five feet in width is almost always to be found very near the center of one of the sides. And when there is a double wall, a passage in the enclosed wall exactly corresponds to that in the outer.

In many cases near the center of the enclosed space, rather to the side farthest from the entrance, and sometimes quite in one of the remote corners, an apparently solid square of stones will be found, from 3 to 6 feet high, and from 12 to 15 feet in length and breadth, in which is a rude vault about 6 feet long, 3 to 6 feet broad, and from 3 to 5 feet deep. Long broad stones form the roof of the vault; and often, immediately before the entrance through the outer wall, an obsolete opening into the vault will be seen, which has been carefully filled up in a way that shows it was done after the original walls of the vault were built. It is sometimes impossible to find a vault in this central square, yet not often. An entrance to the vault can usually be effected with comparative ease from the top, though that is most palpably not the original intent. Human bones, far advanced in decomposition, are not unfrequently to be found in these vaults, with ornaments such as were no doubt once used by the inhabitants, and that are much like those still valued by the natives, not only of Ponape, but of most Micronesian Islands both to the east and west.

3. In one locality on the eastern shore of Ponape, at the mouth of the Metalanim Harbor, on the coral flats between the encircling reef and land, a number of artificial islets are so arranged over the space of perhaps a square mile, that the appearance is such as the submerged foundations of a modern city, with no superstructures, might present.

These are the "Ruins" first described by a sailor named O'Connell, in a small volume en-

titled his "Adventures," and spoken of in Hale's Report on Ethnography and Philology, connected with the U. S. Exploring Expedition. So much of the irreconcilably and egregiously incorrect is mingled with O'Connell's narrative, not only regarding the ruins, but concerning everything connected with the whole island, that I shall but slightly allude to it, though it has the considerable merit of having been the first published notice of these structures.

Where these peculiar ruins are found, the distance from the land to the encircling reef is not half a mile. Coral flats, slightly higher than low water mark, occupy the whole space. Some of the islets are regular parallelograms, 50 feet and upwards in length; others are very irregularly trilateral, quadrilateral, or polylateral, covering in some instances several acres. They are so arranged in relation to each other, that canal-like spaces intervene, on an average perhaps 12 feet wide, through which the tide ebbs and flows. At the junction of canals or streets from different directions, they often widen out to many yards.

The unvarying structure of these islets, is an outer edging or facing of basaltic rocks, chiefly prisms, while the whole enclosed area is filled up with closely packed coral stone, to the level of the top of the basaltic wall, which is one, two, or three feet above high-water-mark. In but very few cases is this skeleton of the islets crumbled. On several of the islets there are walls of the same structure as those before described, forming enclosures, both with and without central vaults.

This whole assemblage of islets is now overgrown with vegetation. Some of the larger islets are occupied by bread-fruit and coconut trees; the rest, together with large portions of the canals are enshrouded with the mangrove. Till within the memory of some living, (1852,) the whole of this locality was densely populated, with the exception of the most sacred spots, and no mangroves were allowed to intrude. A few inhabitants are still to be found there.

On one of the islets, named Pankalera,

where some of the most important religious ceremonies of the tribe are several times a year performed, a sort of paved way laid with broad stones, some of them having a peculiar central depression, leads to a spot peculiarly sacred, over which a small shed is erected. Near by are several low walls forming more or less decided squares, at different points of which religious ceremonies are at stated seasons performed. There are several other sacred islets where ceremonies are at times celebrated, and where low walls or pavements can be seen by those who dare venture in. In the canals at several different places, are stones of peculiar shapes, one of which is called a turtle, one an ear ornament, one a wooden trough, and one an instrument for pounding food, all which are connected with mythological tales.

I will not more particularly notice any of the islets save that one named *Nantoaj*, the most singular and astonishing one of the whole number, from the structures erected upon it. It was the structures on this one islet alone that were briefly and accurately described by the Rev. Mr. Clark, and for the first time delineated by Mr. J. T. Gulick, in the "Friend," of Dec. 17, 1852, Honolulu, Sandwich Islands. I copy a description of them, written by Mr. J. T. Gulick, Oct. 1852, and ultimately laid before the American Geographical and Statistical Society.

"They present a front of 160 feet, and are over 250 feet in length from east to west, occupying a little islet about an acre in extent. The foundation platform, which consists of coral stones with a basaltic facing, rises about eight feet above low-water-mark. On the west side, the walls, which are about 20 feet high, are placed back from the edge of the foundation works, leaving a platform 15 feet wide; but on each of the other sides, the face of the wall corresponds with that of the buttress, presenting a perpendicular front 28 feet above the water.

"Except on the front, or western end, the walls are not only over-topped by large trees, but are even buried in the green foliage of ferns

and bushes, and long hanging vines. They appear quite perfect, except in one place on the north side, where, for the space of a rod or two, the wall has given way on the inside, though the outer face is perfect, and also on the north side western entrance. A broken place in the platform on the front side affords an easy ascent, and an entrance 15 feet in width opens through the walls to the structures within.

"At this place we entered and spent two hours or more in exploring the vaults, measuring the walls, and securing specimens of the prismatic formations, which are almost the only kind of stone found in the walls. Many of the prisms are over 10 feet in length, having five, six, and seven sides—the five sided ones being the most abundant. One that we measured was 18 feet in length, and about 2 in diameter, having six sides. In constructing the walls the stones of one tier have been laid parallel with the line of the wall, and those of the next transversely. The smallest prisms were 3 or 4 inches in diameter.

"Within the outer bulwarks is another enclosure, with 75 feet front and 95 feet depth. It has a foundation platform of its own, on which its walls and the main central vault was built. This platform is 8 feet above the main foundation on which the outer walls stand, and is 100 feet broad, by 127 feet long, which leaves a walk around the enclosure 20 feet wide on the eastern side, and 12 feet wide on the other sides. This wall rises 10 or 12 feet above the platform which leaves the top but a foot or two lower than that of the outer walls.

"The lower part of the outer wall is 18 feet thick on the west side, and 14 feet on the other sides; but at a height corresponding with that of the foundation of the inner enclosure, the wall is narrowed, leaving a walk 8 feet wide around the inner side. Above this, the walls are 10 feet thick in front, and 6 feet on the other sides. Besides the wide entrance on the west side, there is a little passage about 5 feet wide and 4 feet through the wall on the south, and a similar one on the north side.

"The inner walls are built on the same plan

as the outer ones—the lower part being ten feet thick, and the upper but five. They are, however, finished differently at the top, for the last two or three courses of stones jut beyond the face of the wall, forming a cornice about 2 feet wide on the outer side. The entrance is on the west side, directly in front of the first one, and of about the same width. In the center, is a pile of stone work 12 paces square at the bottom, and 8 or 9 feet in height. Two surrounding platforms, each a yard in width, divide the ascent to the top into three steps. The top is about 24 feet square. Within this structure is a vault; and in the west side, directly in front of the gateway, there seems to have once been a doorway leading into it, which is now strongly blocked up. A narrow entrance has, however, been opened at the top, through which we descended, and found ourselves in a dark cell 8 feet deep, and 11 by 10 feet in length and breadth. The only light that reached us entered through the cracks between the long prisms laid across overhead. The foreigners told us that coral stones once formed a pavement on the floor of the vault, but within 10 or 15 years they have been torn up by visitors searching for relics. They say that in 1838, Capt. Chas. Coffin, of the ship *Ohio*, Nantucket, and Capt. E. B. Sherman, of the *Marcus*, Fairhaven, visited the vaults together, and took from it several human bones of gigantic size.

"We entered two other vaults, which were outside of the inner walls in the foundation platform, and not marked by any building above—one on the north and the other on the south side. We were told that Mr. Dudoit, who is now in the Sandwich Islands, took two silver crucifixes from the vault on the south side. Besides the vaults we entered, there is one outside of the inner wall, on the east side. We were told of ten others, but their existence is very problematical."

It is only necessary to add to the above description, that about the islet, on its seaward, north-eastern aspects, are several low enclosing walls, one without the others at varying distances, the outermost of which is distant from

the islet perhaps 600 feet, and runs so close to the edge of the flats that a vessel might almost ride alongside of it.

THE BUILDERS OF THESE STRUCTURES.

I unhesitatingly acquiesce in the opinion of the Rev. Mr. Clark, of the Sandwich Islands, and of Mr. Hale, of the U. S. Exploring Expedition, that none but an uncivilized race of people built these various structures on Ponape. The idea that buccaneers, or Spaniards of any character, erected any part of them, is the result of a pure exercise of an undisciplined imagination. It is palpable that the race who built any portion of these structures, built the whole;—if Spaniards built any, they built all. And more, if Spaniards built any of these Ponape wonders, they also built all those that are to be found on, probably, every "high" island of Micronesia,—those certainly on Kusaia, (Ualan, or Strong's Island,) on Yap, and even on Tinian. Whatever may be reported in print by Capt. Fisher, (as found in the "Annual of Scientific Discovery" for 1853, quoted from the "Vineyard Gazette,") and verbally by others, of a splendid modern "city" in ruins on Tinian of the Ladrone Islands, we must, till their reports are very much more fully confirmed, continue to deem those structures nearly allied in character and origin to all that have yet been discovered in Micronesia—evidently the handiwork of a numerous, active, architectural, but uncivilized race. Even D'Urville, in his description of the ruins on Strong's Island, utters not a suspicion that civilized talents were demanded for their erection.

But it will be sufficient to confine our attention to the ruins on Ponape. We well know the general character of structures Spaniards would have erected during any portion of the centuries they have more or less actively navigated these seas. How different they would have been from anything we find on Ascension Island, need not more than be alluded to. The silver crucifixes, and the Spanish dollars found in one of the vaults at Nantoaj; with a pair of silver dividers, and a brass cannon, found long since on the south side of the island; together

with the tradition that a boat's crew once landed there with skins (probably coats of mail) so thick, the only mode of killing them was to pierce their eyes, only prove that Spaniards, or people like them, have been here. It is now three centuries since the Spaniards discovered Guam. It immediately became their "half-way house" between their South American colonies and East Indian Possessions. For more than two centuries they traversed these seas most actively, and Queroza probably discovered this very island in 1595. It would have been passing strange had none of them ever stranded on this island, and so brought the few relics found.

But again—it seems to me as certain that it was the ancestors of the present race, as that it was not Spaniards, who built these Ponapean structures.

The present race are fully competent to everything found, and are most intimately connected with them by traditions and religious customs. Why, then, multiply causes, when the one most palpable, and immediately before us, is more than sufficient?

But it is objected that the present race is not competent—that the inhabitants are too few, too indolent, and have no capacity or talent for such labors. That they are at present too few and feeble is undoubted. They now number on this island about 5,000. Yet, three years since, there were not far from 10,000, and twenty years since there were probably twenty or twenty-five thousand; and a century since, it is probable, from traditions, that their numbers were even still greater. They are now divided into five tribes, but it is certain, from well expressed tradition, that this is but a modern division.

That they are too indolent is equally true at the present time. But they were not always thus. The depressing and enervating influences of tobacco, and rum, and foreign disease, take the life out of every people, and are most palpably doing so to this people year by year. There is the most positive evidence that in other departments of labor, the degeneracy of this people is even more marked than in that

of building with stone. Their canoes, and houses, and various utensils of past times, if now seen, would scarce be supposed to be formed by the present race.

That the present inhabitants have no talent or taste for laying stone, is quite a mistake. They lay stone quite admirably. The foundations of their houses to this day are of stone. They are of course laid by the eye, yet the angles are square, and the faces plumb where any care is exercised. They are, most emphatically, to this day, a stone-laying people; perhaps even as much so as the inhabitants of Strong's Island, who, till very recently, rebuild the walls about a chief's house on the death of any member of his family.

Two large buildings have been erected on this island within three years, that serve much to correct the notion that this people, when much more numerous, and when united under one head, could not have built even the most enormous of the structures now found of ancient dates. One was a building 60 feet long, by 40 feet wide, on a solid foundation 4 feet high, erected by the Nanakin of the Kiti tribe. The other was also a private residence built by the then King of the Metalanim tribe in the northern limits of his tribe. It has a double foundation; the first is a solid platform of stone, 100 feet by 30, and 8 feet high. The second foundation is a second solid platform, built on top of the first, 30 feet long, 20 feet wide, and 8 feet high.

The following extract from the Rev. Mr. Doane's Journal, while natives were engaged in laying a Ponape foundation of his house on Jeikoits, is testimony exactly to the point:—"I was not a little interested with the earnestness with which they worked. Surely, if there were fifteen or twenty thousand natives on the island, they could accomplish any piece of work they undertook. The way in which especially the stones, very large ones, were laid hold of and brought to the place, suggested to my mind a sufficient explanation of the structure of the large ruins on this island. Supposing at some past time the population may have been 20,000,

and this large number controlled by religious zeal, and powerful, ambitious chiefs,—I think from the way natives to-day took hold of the large stones, requiring five or six men to carry one, the work on these ruins can readily be accounted for. All that is needed is some powerful will to command.”*

It is also objected that this people have no knowledge of the builders of these structures—have no traditions concerning them; that they have nothing whatever to connect them with the ruins themselves. This objection is founded on as total misapprehension as the first.

They have many traditions concerning them. They unhesitatingly say the “ani” built them; and Hale most correctly conjectures that “when the natives say these structures were raised by ‘han’ or ‘animan,’ (spirits), they may be merely referring them to their ancestors, the actual builders.” They not only “may be” but most certainly are. It is true that some of their “ani,” or spirits, are self-existent, but the great mass, and those that receive the most immediate worship, are but deceased ancestors; and every person, of every age, and grade, immediately after death, and before burial, is termed an “ani.” I will reserve to another paper a detailed notice of some of the most interesting of these traditions.

There are not however only traditions connected with these ruins, but a large number, if not all, of the stated religious ceremonies are connected with them, and are performed in or by them. As has been already remarked, several points among the islets at Matalanim, including the celebrated *Nantoaj*, are places of worship at various different seasons of the year; and are so sacred that the mass of the common natives do not to this day enter their more

tabu parts, unless in the convoy of a missionary, and even then but few of them, and with hesitancy. So also of many places in all parts of the island.

THE OBJECTS FOR WHICH THESE STRUCTURES WERE BUILT.

It might well be conjectured that such a stone laying people might employ stones for various different objects, on an island where this material so abounds; and the differing appearances of the ruins, confirm the idea.

1. The long, apparently aimless, lines of stones, may have been to form substantial paths, and perhaps to preserve the land on the declivities from being washed away; and a secondary purpose may have been to partially rid the cultivated land of the stones. This last seems to be the more palpable intent of the irregular stone piles in some of the more rocky parts. On a smaller scale, it is to this day performed by the inhabitants of those localities, so as to employ to advantage the little earth found between the rocks. Stone walls of this character are to be found in some of the rocky portions of the Sandwich Islands, and probably other South Sea Islands. In a few cases, the attempt at a rude wharf can be detected, alongside of which, at high tides, canoes do to this day lay with advantage.

2. The enclosed spaces, with vaults, were, without a doubt, places of sepulture, the vaults being tombs. The natives readily acknowledge this. Often human bones, not fully decayed, may be found in the vaults; from which it is evident bodies were deposited in them at no very remote period; for bodies laid comparatively exposed like these, could not many years remain in such a humid climate as this. The vaults on the *Nantoaj* islet were the places of sepulture for the highest chiefs of the tribe, till since the residence of foreigners on this island. They have only ceased to be tombs since the natives learned to fear the intrusive Yankee. It is by no means to be supposed that entombing was in ancient times the only mode of disposing of the dead; for it was probably the more noted chiefs and priests alone that were

* Says the Rev. Mr. Sturges, in *The Journal of Missions*, August, 1855:—“Some have supposed these walls were for defence, and that they were the work of a more civilised people than now live here. I see no necessity for either, as the whole would seem to be of use in the religious rites of the present natives; and there is nothing about them requiring any more skill than is found among this people. The only thing wonderful is, that so much labor should have been performed without machinery.”

thus honored. This mode of honoring the dead has been gradually less and less resorted to, till now it is discontinued.

The quadrangular walls without vaults, may possibly some of them have been the boundaries of special lots, gardens, or family inheritances; but some of them, we have good evidence, enclosed places of burial, which will incline us to view them all as marking burial places. Some such places are still most sacred, and religious services are performed in connection with some of them. Some of the structures on the islet Pankatera, where chiefs have undoubtedly been buried in graves or concealed vaults, are of this nature.

I have not, on this remote island, the requisite books for verifying any conjectures, but I am strongly impressed with the idea that structures of the general character mentioned under this head, are to be found on many of the Polynesian Islands. Ancient ruins, conjectured to be tombs, are found on the Tonga or Friendly Islands. (Latham's Nat. Hist. of the Varieties of Man.) Many of the sacred enclosures on the Society Islands were mere parallelograms enclosing sacred houses. (Ellis' Polynesian Researches, Vol. 1.) And the "*heiaus*" of the Sandwich Islands were certainly of this general character. The idea of sepulture may have become disconnected from such structures before the race reached those most eastern islands, while yet the style of building was retained.

3. The islets near the mouth of Metalanim Harbor are, I think, the result of a taste for residences in very close proximity to the sea, and probably the high chiefs of the whole island once resided near each other in this miniature Venice. The chiefs of Strago Island to this day tend to congregate on the small island in their weather harbor, where the structures are in some degree insular and submerged, as here. The common taste for such "marine" cities, will probably yet be traced to habits in the "fatherland," from which they diverged. It is palpable, also, that the labor of erecting such structures, are greatly less from being close to, or in, the ocean. The prisms of which these

ruins are built, must have been brought from the northern aspects of the island—distances of from eight to fifteen miles.

The quadrangular walls, with and without vaults, together with any other superstructures, were probably added to some of the islets on the decease of the prominent residents. If any prefer, however, it would not be an eccentric theory to suppose the islets employed as places of burial were specially built for that very purpose, and that the others grew around them as about central points.

The walls running along the N. E. aspect of this vicinity, and extending to the edge of deep water, seem very probably to have been a barrier against the heavy swell of the N. E. trade winds.

It is interesting to remark, that one of the most regular of the islets, standing quite by itself in a very central locality, is reported to have been the site of a large feast house, and that a few years since, the inhabitants of the Jekoits tribe took the measure of it, and built a feast-house on the Jekoits Island, of exactly the same size.

This submerged locality may, even to this day, be considered the head-quarters of the whole island. More important ceremonies are performed here than anywhere else, and many of the performances in other places have some reference to those here. The chiefs and priests of this tribe are to this day the most bigoted, and are the rallying points of the island's crumbling heathenism.

Mr. Hale's suggestion, that the island of Ponape has undergone "a slight depression" since these structures were erected, seems, on inspection, to be no ways probable. The foundations of these islets are laid on the coral reef that rises an inch or two above the very lowest stage of the tides. To those acquainted with the entire reliance of this people upon canoes, even to this day, as vehicles for moving for even the shortest distances, it seems not at all improbable, that in building anything extensive, a submerged locality should be selected.

I hazard no special remarks on the objects

of the long mound, as I have not had opportunities for sufficiently examining the two or three known to exist. From what I have seen, and from tradition, I judge them to be connected with the noble "dead"—the "ani."

CALIFORNIA, OREGON, WASHINGTON.*

That province of Spain, known on the old maps as California Alta, was discovered in the year 1542, by Juan Rodriguez Cabrillo. In 1697 it was granted, in common with California Baja, by Charles II, of Spain, to the Jesuits, in the hope that the disciples of Loyola might subdue by the cross those hostile tribes the colonists had failed to subdue by the sword.

But these men, though nominally the possessors of the country, never entered upon their labors within its proper limits. True, they had several stations in California Baja, and there had in a great measure ingratiated themselves into the affections of the aboriginal races, and partially accomplished their mission of civilization. The edict for their banishment from America, however, was signed, and in 1769 they were totally banished from the soil which, by their energy, wisdom, and foresight, had been made habitable for a superior race.

In the same year, Spain took military possession; but, not unmindful of the religious welfare of the natives, sent with her armies into the new country many priest-missionaries of the Franciscan order, who settled at the military presidios, and established the first churches in the wilderness. In this way the missions of Monterey, San Diego, etc., were commenced. By 1798, eighteen of these missions were in full operation, confined almost entirely to the coast and the coast valleys—it being the policy of the fathers to withdraw the tribes from their hunting and fishing grounds, and collect them at such convenient centers as would best promote the objects in view.

These objects appear to have been to bring the native tribes under Christian instruction,

and to train them to agricultural and other industrial pursuits. For this purpose the very best sites were selected, combining fertility of soil, facilities for irrigation, and access to some harbor or landing place for the exchange of such products as the good of the several missions might require. To carry out those objects, something like force is said to have been resorted to. When the prospect of gratuitous supplies from the teachers failed to bring in the tribes, forays are said to have been made upon their villages by the soldiery, (always kept by each mission for its protection,) by which hundreds of men, women, and children, were driven in like captives within the mission enclosures, where they were summarily baptized and indoctrinated into the mysteries of the Roman faith. This, however, was but going out into the highways and hedges, and compelling them to come in, and was in perfect keeping with the spirit of their church, and with their modes of proselyting savage and heathen tribes both on the Asiatic and American continents.

It must be said, however, that the fathers of those missions were apparently worthy and devoted men, pursuing their work with the good of the savage tribes in view. They have left behind them many monuments of their industry and piety, their forethought, and their good taste. The size and style of their cathedrals, most of which still survive; the number and arrangement of the houses for the Indians; the extent and excellence of their improvements in agriculture and horticulture; in orchards, vineyards, groves of olives, and shaded causeways—some of which are, to this day, the best in California—all sustain their reputation for intelligence, and private and social worth. While they had control, the missions they established seem to have been kept to their legitimate objects.

But a change came over them. This occurred in 1824, when California became a province of Mexico, and the missions passed from the superintendence of the Spanish to Mexican priests. Then, from spiritual, they gradually became purely secular. The padres became proprie-

* An Address, read before the American Geographical and Statistical Society, by the Rev. T. Dwight Hunt, of Newark, N. J., on the 26th March, 1857.

tors, and the Indians were herded and trained, not so much to become Christians, as to catch and flay wild cattle, and dry their hides for Boston traders. Everything of a purely missionary character went speedily to ruins, and the missions, as such, ceased to exist; though the mission buildings, and the immediate premises, comprising the orchards and vineyards, are still claimed by the Roman Church, and constitute no small portion of its prospective wealth in that State.

And not only the missions, but the whole territory of California, seems to have declined during the few years of Mexican rule. Revolution succeeded revolution, till public insecurity became so great under the Mexican governors, that there was a readiness on the part of the people to strike for independence. And this would undoubtedly have been accomplished, but for the conquest and subsequent purchase of their country by the United States.

Thus it appears that the country had been in the possession of the Spanish race for nearly 300 years, and under the fostering care of the Roman Church for nearly 150 years. Long before the Pilgrim Fathers had landed on the bleak shores of New England, that fair land, of which the early navigators were lavish in their praises, was opened to the enterprise of the most wealthy and powerful maritime nation of the world. But how slowly, almost imperceptibly, did civilization break in upon the darkness! how long, but in vain, its mountain forests invited the axe, and its broad prairies the plough of the settler! How long its bays and rivers were disturbed only by the canoe of the savage, save only as some adventurer from regions less inviting entered the gate of its great harbor, and wondered at its solitude!

But while that land reposed so quietly in its beauty, the wild Indian still gathering the grasshoppers and acorns of the valleys for his food, the English colonies on the eastern shore were rapidly springing up into life and maturity. Under a stormy sky, in an unbroken forest, upon a stony soil, amid far more powerful and hostile tribes, and suffering under poverty and

pestilences unknown on the Pacific, the few exiles of 1620 were founding an empire, the glory of whose industry, intelligence, liberty and piety, no less than of wealth and power, should eclipse that of Spain itself. True, New England was nearer the Old World, and had the advantages of immigration and commerce. But why did not Mexico, and even Florida, with superior advantages of climate and soil, keep pace at least with the country north? True, also, that since the occupation of California, the discovery of gold has been the occasion of its rapid and unparalled growth. But the history of that country, from the time of its conquest and possession by our countrymen, down to the discovery of gold, proves that even without that extraordinary stimulus it would have rapidly become populous, wealthy, and great. It also proves that the difference between its development for two centuries and a half previous, and ten years since, has not been so much a difference of circumstances, and of the spirit of the age, as a difference of the people who have been in possession, and of the institutions, civil, educational, and religious, under which the people have been reared, and by the spirit of which they have been and are inspired.

For it is a fact not generally known or appreciated, that after the occupation of that country by our forces, San Francisco, then called *Yerba Buena*, began at once to give signs of new life. As the Roman arms everywhere carried Roman laws, customs, letters, and civilization, so our own conquest was but the forerunner of our institutions. Down to that period the town had been merely a port of entry for an occasional whaleship that touched there for wood and water, and a few merchant vessels that brought "Yankee Notions" to exchange for hides and tallow. It consisted of a one story adobe Custom House, and a few scattered tenements of the same material, without streets or enclosures, having no reference, apparently, to any growth in the future, and having no higher importance than as an embarcadero for the missions three miles south. There was, indeed, a fort at the entrance of the harbor, but it was of

ancient structure, and had long since gone into disuse and decay. The whole aspect of the place was of the most unpromising and forbidding character, as though the people, so long in possession of the territory, had overlooked the magnificence of the harbor, and not even dreamed of its importance to the future commerce of the world. Indeed, as if blind to any wants of the fair Territory whose larger rivers had but that one outlet to the sea, and whose vast valleys must send down their future products through that outlet to distant markets, they had established the Capital at Monterey, and concentrated their wealth there, and invited commerce there, where access was difficult to the agricultural valleys, and whose only anchorage for vessels was an open bay exposed to the sea!

But what the Spaniard and the Mexican had failed to see, or seeing, had failed to appreciate, was seen and appreciated by the American at a glance. The conquest of the country was followed immediately by signs of improvement. The spirit of speculation commenced even among the officers of the army and navy, many of whom by their wise forethought laid the foundation of independent fortunes, in purchases and grants of the sand hills and mud flats of the miserable town of Yerba Buena. It was not long before the town was surveyed and laid off, and the name changed to its present more pretentious and commanding title. There was very little business at that time in the Territory to build up rapidly a place of importance. No one expected a rapid growth. No one could predict by just what resources a commercial town was there to be created and sustained. But two facts encouraged them. First, the Territory was now American, and second, American enterprise would not long leave so fair a land uninhabited, nor so magnificent a harbor unimproved. *Faith in the future* was a sufficient stimulus, and the town began at once to assume some form and size. A few American traders soon ventured to open stores there. This attracted attention and created a coast traffic. This, in its turn, stimulated to some

extent agriculture and the mechanic arts. These created demands that could only be supplied by vessels from abroad. Thus a beginning had been made, which though small was indicative of an importance in the future, of which the race that had held possession more than 200 years had never conceived.

The growth of the place was principally by sea, though a few families had already found their way thither over the plains. Some who had in previous years strayed over the desert, and tented in the Territory while it was a province of Mexico, now repaired to the only town that was in fact American.

Many soldiers, too, of the regular and volunteer armies had remained in the country after the conquest, where occasional, if not constant, employment afforded them the means of indulgence. Of the early accessions to the population by sea, the most numerous, though not the most promising, was a ship load of *Mormons*, who landed there from New York in 1846, under the leadership of one *Sinnuel Brannan*, who is now one of the most wealthy men in the State. The colony consisted of about 200 men, women and children, who were seeking a home on the Pacific, and whose designs were partly missionary and partly political. It is not generally known, though it is probably true, that their design was to plant a Mormon Church and a Mormon Commonwealth at the same time, and so unite with their brethren, already in Utah, in consummating their dreams of a "New Jerusalem," not in the valley of the Mississippi, but on the shores of the Pacific. The evidence of this is not positive; but it is certain that the company started thoroughly armed, and added to their armory all the weapons they could purchase at Honolulu, where they touched on their way. But whether such were or were not their ambitious designs, they settled down quietly at San Francisco as citizens when they found the country in the possession of our forces. And there they remained until the discovery of gold in 1848 scattered them, in common with all other classes of settlers, into the river beds and mountain ravines.

Down to the time of this discovery, the town had thus gradually increased, until it contained a population of about 400. There was no church, but there was a public school-house. There was no minister of the gospel, of any denomination, but the teacher of that solitary school was a New Englander, and a pious man, a New London graduate of Yale College, and once a licentiate of Andover, who opened his school daily with reading the scriptures and with prayer. There was no public worship except a small prayer meeting in a private room, but there was a Sabbath school in the school-house where children were taught the word of God. San Francisco was then a settlement of families, like the settlements of the West, and gradually there was growing up in the village the institutions of education and religion our people never fail to carry with them. And this settlement was of two years' growth only, under every discouragement, except the hope of an important though distant future, and without any greater stimulus to the energies of the people than was furnished by their own creative enterprise.

What a contrast this rising place of two years' growth presents to the Yerba Buena of the Spaniards and Mexicans, who had had possession of the bay and harbor for more than two centuries! How clearly it demonstrates, that without the discovery of gold, the progressive spirit of our people would have eventually established there a flourishing State.

Thus San Francisco had begun to be, had begun to grow, had begun to promise a great future before the discovery of gold. And I have dwelt upon it longer than it would deserve, were it not that the facts are not generally known. Moreover, we are now better prepared to trace the results of that discovery, which was the great event in the history of the city and the State.

The first effect, however, of that discovery, was to depopulate the city. Everybody that could get away, even women and children, left for the region of gold. A few only remained, who were shrewd enough to look into the

future. But the village was not long deserted. Vessels that had been despatched to Oregon, to Mexico, and to the islands of the Pacific, for supplies, took the news everywhere, and with the supplies brought also a crowd of consumers. Immediately the deserted places were filled, and even tents, and cloth covered frames, and cowsheds, and ships' cabooses, were in demand for shops and stores. Everybody was on the move. Everybody was in a hurry. Everybody was for himself. Once in the world's history, everybody was getting rich. No one was in want. No one stole from his neighbor. No merchant took in his samples at night. It was the millenium of money-makers. And yet the crowded town was a second *Babel*.

It was during this confusion of many tongues, and haste of many races, that my acquaintance with the town was first formed. It was in the fall of 1848, the year of the discovery of gold. Perhaps 1,000 people were domiciled under various coverings on the hill sides, and along the beach of the bay. But the place had not as many families as when its population was less than half that number. Not a wharf reached out to deep water. Not a steamboat disturbed the bay or rivers. Except, possibly, here and there a chimney, not one stone or brick lay upon another. The school-house was empty; teacher and scholars had gone to the mines. There was no Sabbath, and no worship, except to about thirty of the people, who, for two or three Sabbaths, had met to hear the English service read by the captain of an English brig then in port. This was before authentic news of the gold discovery had reached the Atlantic States, and four months before the first mail steamer entered the harbor, bringing the first of the immigration that so rapidly made us a people and a State.

From that period the growth of the city and the whole country was rapid beyond all precedent; and it continued to be so until competition in every department of labor and trade made both comparatively unproductive. Yet during this growing period, no country ever suffered such losses by fire and flood. Five or

six times were the business portions of San Francisco reduced to ashes. Yet each fire improved the appearance of the city, which now numbers from 50,000 to 60,000 souls. Sacramento, 100 miles to the north-east, was twice burned down, and thrice submerged. Yet it presents to-day a beautiful front, with a population of 15,000, and ranks second in size and business in the State. Marysville, fifty miles further north, successively struggled through the same destroying elements, and survived them in beauty and prosperity. Stockton, a city of 5,000 people, 100 miles east of San Francisco, on the San Joaquin, also suffered severely and repeatedly, yet grew steadily in beauty and permanency.

Still more did the mountains suffer—no important settlement escaped; yet from conflagrations that would have annihilated the towns of some countries, and disheartened an ordinary people, they have risen from their ashes greatly improved. Such are Nevada, Placerville, Grass Valley, and Auburn, each as populous and active, and buoyant, as if the fire had never scathed them. Such, also, are Shasta and Yreka, in the northern portion of the State—the latter having come up from complete ruin, to astonish every traveler with its fifty fire-proof stores of brick and iron. Perhaps no other people has shown such a degree of energy—an energy displayed as well in the building and rebuilding of cities, as in the turning of the mountain streams, through 1,000 miles of canals and ditches, and honey-combing the mountain slopes in search of veins of quartz and beds of gold.

But *who* are this people? Perhaps the most heterogeneous ever drawn together. Probably no one State in our Union so largely represents every other. From Maine to Texas, and from Florida to Iowa, there is scarcely a town, or neighborhood even, that has not contributed one or more to that strangely mixed people. Of *foreign* element, there is the variety of the great West, within the narrower compass of a single State. Added to these, are some of nations little known, and seldom seen upon the

Atlantic shore. Of *Germans*, *French*, and *Irish*, we have about the usual proportion. Of *English* there are less, and of these the *Cornish* are mostly in the mines, and working, as usual, under ground. Of *Jews* there is an unusual number, engaged almost exclusively in the *clothing* trade, which in many places they monopolize. A mining or a laboring Jew would be a prodigy. Such, also, would be a Jew who kept either our Sabbath or his own. Of *Spaniards*, we have a remnant of the colonists from Mexico, and of their half-caste Indian descendants, who are scattered over their government grants, caring little, as formerly, to improve their farms, and living idly on the sale of their large estates, or on the increase of their flocks and herds.

These grants have been, from the first occupation of California by our people, the great drawback to the settlement of the country, involving all titles in uncertainty, and embarrassing the whole agricultural interest with the slow and doubtful decisions of the Land Commission on the one hand, and the fraudulent claims of forging land speculators on the other.

To these Californians there must be added, as belonging to the same family, a large number of *Sonorans*, who are engaged mostly in mining, though many are employed as muleteers of the large pack-trains which are extensively used in conveying merchandise to remote mountain districts, and which only a mule can reach. They are, perhaps, the worst class of the whole population—a horse thieving, murderous clan—against whom the Americans in their vicinity have more than once united, either for the purpose of self-defense, or their expulsion from the country. Like the Californians, they are universally addicted to gambling, and are guilty of a vicious or a useless life. Like them, also, they are devout *Romanists*—and with them and the great majority of the Germans, the great body of the French, all the Irish, and a few renegade Americans, (proselytes by marriage,) constitute the strength and wealth of that Church upon the Pacific Coast.

A very different class, however, are the *Scotch*

and the *Welsh*. Almost invariably, these are industrious and reliable citizens, thrifty and useful, wherever found. The Scotch are not numerous. The Welsh are more so, and far more clannish. They are almost always found in communities by themselves, whether in the cities or in the mines. They are a sober and a religious people, but in everything *intensely national*. They must trade at a Welsh store. They must employ Welsh laborers. They must have a Welsh meeting on the Sabbath, and a protracted meeting at any time—though the best and busiest mining time—whenever a Welsh preacher makes the tour of the mountains, searching for the scattered Welsh sheep.

In this respect they are very like a large settlement of *Moravians* I found on one of my tours in Oregon. They were a colony of farmers from one of the border Western States, who, on emigrating to the valley of the Willamette, took with them their mechanics, their store keeper, their teacher, doctor, and preacher, so having the complete furniture of a community by themselves. And there they settled in the same neighborhood, built their own church and school-house, and employed their own mechanics, physician, and preacher. They were a fraternal band, and had no need of a *lawyer*. They were a community *by themselves*, which was and is their greatest fault, though friendly to other settlers and other Christians, and well spoken of by those around them. They exhibit, nevertheless, some of their old missionary spirit, and their churches are called, as usual, by the name of the "Church of the United Brethren." I know of none of this people in California.

Of *Asiatics*, I have seen, now and then, a few *Hindoos*. But they have been a strange plant that has been cast upon the shore, not to take root. The return wave has borne them away again to their own shore. So, also, of one crew of *Japanese*, who drifted across the Pacific in a junk, and were picked up on our coast in an emaciated and almost lifeless condition.

But not so the *Sandwich Islanders* and the *Chinese*.

Of the former, there have been several hundreds, perhaps 1,000, at a time, scattered in small companies over different portions of the middle and northern mines. Understanding their language, I have repeatedly preached to them in various parts of the State. For several years I gathered them every six months at such places as would best accommodate them, preaching to them, conversing with them on personal religion, and administering the sacrament to the Church members: 125 of them were thus together at a meeting once held in Sacramento. From them and from Americans I learned several facts most interesting to the friends of that mission. Of these I can mention but one or two.

Wherever enough of them were together for social worship, they observed the Sabbath religiously, meeting in some cabin or in some booth-chapel erected for the purpose. Having brought their bibles and hymn books with them from the Islands, one of their number would read a portion of Scripture, and exhort the company, he and the others uniting in prayer and song, and conducting worship in a manner every way worthy and appropriate. And this they did of their own accord, and in the midst of the camps of the most ungodly Americans. Even some pious Americans, having no place of their own, have been known to repair to the camp of the Hawaiians to escape the noise and revelry of their own settlements, and to catch the *spirit* of a worship, the words of which they could not understand. What a spectacle! A company of converted idolaters, but few of whom were church members, yet devoutly keeping the Sabbath and worshipping God on the mountains of California, while the noise and revelry was breaking in upon them from the camps of our own countrymen!

A traveler told me the following incident:—He had lodged a night in their settlement, having been kindly and hospitably entertained by them with the best thing they had. On the following morning, when walking out to a retired place in the forest, his attention was arrested by a low but earnest voice of prayer.

He was surprised and pleased, and his curiosity led him to trace it to its source. He discovered there, behind a tree, an Islander *pleading with God!* Said both the witnesses to the above facts, "say what the enemies of that mission may, and pronounce as they do, that mission a failure, that alone which I witnessed of that people in California was enough to convince me that the mission has been *a glorious success.*" Those that were not Church members, and some who were, may have fallen, following the example of the multitude by whom they were surrounded. I do not hesitate to say, that as a class, those professing religion stood as firmly and lived as consistently in the midst of temptation as most of their brethren from more favored lands. Certain I am that their simple piety, and their worship of God under difficulties, put to blush many a member of our eastern Churches, who, in early days, pleaded peculiar embarrassments of position as an apology for an unholy life.

But few of them now remain. Deaths and return to the Islands have greatly reduced them, and will, ere long, remove them entirely from our shores.

But what will become of the *Chinese* is a problem of more difficult solution. Of this peculiar people there are about 30,000. They are found almost everywhere, and everywhere they are *Chinese*—peculiar in their appearance, dress, habits, and faith. Everywhere they live in communities by themselves, though occasionally employed in families as house or field servants. Though heathen, they are usually industrious. As traders they are shrewd; as miners they are patient and successful; as gamblers they are inveterate and desperate. They seldom appear at the police or criminal courts, yet in their way, and among themselves, they are notoriously immoral. Of the many hundreds of females, there is not, probably, an exception to their profligacy.

Everywhere they celebrate their national holidays, their neighborhoods or encampments cracking merrily for days together, with the explosion of innumerable fireworks of their own

national manufacture. At their funerals they observe their idolatrous rites, burning perfumed or holy paper over the grave, and depositing food upon it for the use of the dead.

They usually leave China in companies, under certain Chinese employers, for whom they work while in the country. In connection with these companies are charitable associations, to provide for their sick and destitute. By these companies also very many of their dead are shipped to China for interment, so sacred to them is the soil of their native land, and so strong is their reluctance to be left in the soil of the *barbarian!*

In one of their public buildings they have, of late, instituted *religious worship*. The hall is furnished after the style of their pagan temples, and the rites and forms are like those of their idolatrous home. The images within the chancel, the candles burning before them, the priest or priests with robes of various and showy device, the prostrations, the attendance of boys in robes, tinkling their bells and waving their burning censers, are forms and rites so evidently Buddhist in their origin as to impress every beholder with the strange and solitary fact, that on the American Continent, and in the United States of America, the Asiatics have actually dedicated one temple of idolatry! Yet so closely in many things do these ceremonies resemble those of a Roman Catholic Cathedral not far distant, that the spectator might almost doubt whether he witnessed the worship of pagans, or of the proselytes of a certain sect of nominal Christians. Nor is it the first time we have been painfully impressed with the evidence of the *Pagan origin of Papal rites*, though it is the first time we have been taught the fact upon our own shores.

The Chinese are ineligible to citizenship. They are not even allowed to give evidence in a court of justice against a white man. The reason alleged is, that they cannot comprehend the nature of an oath. However this may be, the law has proved most unfair and oppressive. Under it many robberies and murders have been committed by white men with impunity, be-

cause no amount of Chinese testimony could convict the guilty.

In two other ways, also, they have been grossly ill-treated, simply on the principle that "*might is right*." In the *first* place they have not been allowed to work in *productive* mines, but only in localities whose yield would not pay an American. And if, by chance, they have struck upon a "rich lead," there have never been wanting white men mean enough to expel them from it. Repeatedly have they been driven from various districts, though in nobody's way, and interfering with no one's right. And yet, in the *second* place, for this doubtful privilege of working worn-out and abandoned mines, they have been compelled to pay a *large monthly tax*, under a foreign miners tax law. That law is not enforced upon other classes of foreigners. Moreover, it is clearly unconstitutional, the mines not belonging to the State, but to the United States. Still they submit to it because they must, and they make money under it because of their patient industry and the cheapness of their living.

The only plausible apology for such legal or illegal oppression is, that except some check be put upon the immigration, Asia will swarm upon the country from her crowded hive, and by cheapness and overwhelming numbers, seriously interfere with American interests and American free labor. There is here a practical difficulty, but, whatever it be, it should not be dishonorably solved. Thousands of them will remain in the State, and what use can be made of them, consistently with their rights as men and freemen, is a grave question for future solution. But whatever be the difficulty, nothing has yet occurred to justify the oppression, on account of which every true American in California has blushed for his country.

But while this treatment has done much to prejudice the minds of the Chinese against us and our institutions, it is a redeeming fact that the indignation of the good people of the State has been slowly, but surely, coming up to redress the wrong. In some instances they have been invited back to places whence they had

been expelled—though it is but just to say, however humiliating to our sense of right and honor, that *interest*, and not justice has done it; the Chinese *trade* being indispensable to the *merchant*, and the Chinese *tax* being indispensable to the County Treasury. On the other hand, it is a pleasure to state that a late Legislature repealed a law passed by its predecessor, of a most extortionate nature, providing for the gradual increase of the tax, so as to drive them altogether from the country. We believe that something more than the State Treasury influenced that repeal. More gratifying still is it to record the fact, that there are *two Christian missions* in active operation among them—a *Presbyterian* at San Francisco, and a *Baptist* at Sacramento. Both are sustained in part by the Christians of California, and both are useful. A paper is also published weekly at San Francisco, supported partly by our own people, and partly by Chinese merchants.

Christian philanthropy is thus looking to their conversion to the truth, and to their advance from semi-barbarism to complete civilization. At the same time, a wiser and more humane political economy than has hitherto prevailed, is looking to their usefulness in the cultivation of rice, sugar, and tea, for all of which the State has ample and suitable lands, and with the production of which they are acquainted.

Without a doubt, their coming among us was designed of God for the good of their vast empire. A considerable commerce has already resulted from their residence on our coast, and the interchange of products must increase the intermingling of the races—an intercourse which cannot fail of enlarging their thoughts, and preparing them for the proper appreciation of our civil and religious institutions.

Of our *Negro* population, we are glad to say we have *no slaves*. But we regret to add, that they are *not freemen*. Like the Chinese, they are denied the rights of suffrage, and of giving testimony in the Courts. The State, however, does not forget to *tax* their property, of which they hold no inconsiderable amount. They

live mostly in the cities. It is said, but with questionable justice, that they are more than usually dissipated and vicious. Certain, however, it is, that they have several churches of various denominations, and maintain, without aid, several preachers, both in the cities and in the larger mining towns. They number from 5,000 to 8,000 throughout the State.

A hopeful sign of their improvement, both in character and position, was a Convention held last year at the State capital, with a view to petition the Legislature to remove the disabilities under which they feel degraded. A hopeful sign of a more just and generous feeling toward them on the part of the citizens, was the permission allowed them to assemble, and, without interruption or opposition, to carry out their plans. This was before the political campaign, the result of which has been to prepare the way still more for the redress of their wrongs.

Of the *Indians*, there are from 30,000 to 50,000 still surviving, though fast disappearing—a miserable remnant of the *Diggers*, one of the lowest of the tribes on the continent. They approach the level of the Hottentots, living in underground huts, only the roof of which appears above ground, covered with earth. From one side of this roof a small opening lets the occupants down backwards on their hands and feet into their one smoky and squalid apartment. They appear, however, to have some ideas of a Great Spirit, and to have some rites by which they recognize His government, and and manifest their fears. In common with nearly all the tribes on the Pacific Coast, they have a common sweat house, into which, when it has been heated, they all enter and swelter; and out of which, when exhausted by perspiration, they rush into the river or the sea! This is their great panacea for all diseases, though it is undoubtedly one of the principal causes of their debility and premature death.

The United States' Government has made commendable efforts to collect the scattered tribes upon reserves, and with some success. But the Indian is ill at home out of the woods,

and within enclosures. His wild instinct not unfrequently breaks from the restraint, and takes him to his old haunts, to taste once more the fish from his native stream, or the flesh from his native hills; or, as a treat, to gather from the plains and the groves familiar to his boyhood, the bitter mansanita and the delicate grasshopper!

In one of my meetings with the Sandwich Islanders in the mountains, a number of these straggling red men gathered curiously around, to observe our proceedings. I could not but notice their inferiority to the half-civilized Hawaiian. Nor yet could I resist the conviction, that the child-like curiosity and delight with which the savages looked upon the few picture books and papers I presented them, might, by the same culture, be elevated into sufficient intelligence to make them men, and save their souls. As yet, however, no one has attempted their instruction, though it is in contemplation by some of the government agents, to establish a school in connection with each reserve.

The Indians both north and south of California, appear to be superior. Especially at the north, they improve in manliness, both in physical and mental development, all the way to Puget's Sound, and even to the Russian Possessions, where they are both numerous and formidable.

But all over the Pacific Coast their doom is sealed. Liquors, epidemics, and wars, are fast sending them to the long home of the Atlantic tribes. The waves of immigration are settling in upon them from both oceans, and they must ere long be overwhelmed. Pressed upon all sides, they can find no resting place but beneath the sod. But there will be some dying struggles, and revenge will sometimes quench its thirst with blood. And many a settler will lie down with his murdered family, or flee from his burning tenement and desolated fields, before the Pacific Territories will have settled peaceably upon the graves, and over the hunting grounds of the perished tribes. But the day hastens, though we could hail it with more pleasure, as lovers of the world's progress, were

there no innocent blood crying against us unto God.

Of *our own people*, it is enough to say that they are *Americans let loose*. How better could I describe a fast people? They constitute the great majority of the population, and are at once the glory and the shame of the land. They are responsible principally for the character and reputation of the country. Foreign influence has indeed been considerable, and foreign capital has been largely invested, but American influence has been dominant, and American enterprise and energy have directed and controlled. The haste to be rich has been desperate, the wreck of character has been fearful, but the amount of work accomplished within the time has been altogether without precedent. The results astonish even an American accustomed to the growth of the West.

But in the haste and waste, good has not been unmixed with the evil. Some of the world's best people have there mingled with many of the world's worst. And the very surroundings that have shaken the principles of some that had previously stood firm, have established the principles of others, for whose firmness there was less hope. Moreover, the tendency of all things has been to make a *strong* character, either for good or for evil, so that the energies of the people have been developed intensely in either direction, according to their character.

Our charitable, educational, and religious interests, therefore, have not been lost sight of. Indeed, our progress in all these, among a people so absorbed in worldly pursuits, especially among a people non-resident, because not intending to remain, but whose home, and whose interests, and affections, and hopes, are all *elsewhere*, is, perhaps, the most remarkable feature of our strange history. Few cities can boast of better common schools than San Francisco. And the same system has been successfully introduced into other cities. Beside these are many private and select schools, and several higher and collegiate schools for both sexes, all in successful operation. Some of these, in Ore-

gon, as well as in California, are even now, though so young, aspiring to the rank and standard, as well as to the title, of a *University*. Of charitable and orphan asylums, there are several, with permanent buildings, all supported by voluntary contribution, except the State Lunatic Asylum, at Stockton. Every large city has its Mercantile and Mechanics' Library Association, and its Young Men's Christian Association, each with its library and annual course of lectures. Masonic, Odd Fellows', and Templars' Halls, are open in every important town.

Of churches, we have several that would adorn any city in the Union. Eight years and a half ago I was the only preacher in the State, and occupied a school-house for a church. Now, nearly thirty congregations assemble every Sabbath in San Francisco alone. Other cities, and even the most of the mountain towns, are relatively as well supplied. Though the Sabbath is still the great day of trade and pleasure in the mountains, it is not so in the cities below. There, public opinion, in advance of a law, has closed most places of business, and given to the streets the appearance of a home Sabbath. Yet, even in the mountains, church spires are lifting themselves among the pines, and church bells are echoing to each other through the valleys and over the hills.

Though our prisons contain more criminals than our State can afford to keep, and more are at large than are confined; and though the factions of evil men become occasionally so formidable as to require the combination of all good men in self-defense, and justify them even to usurp authority, and violently put down the villainy; yet, to the most casual observer, the improvement of the State has been constant in all that underlies the prosperity of any people. The haste to be rich is greatly moderated. Immorality is not so unblushing. Public gambling is suppressed by law. Political corruption is not so dominant. Public sentiment on all moral questions is improving. And, what is more important than all, as supplying the great want of California, *the population is more permanent*, and

homes of beauty and contentment, no less than schools and churches, are everywhere springing up to adorn and bless both the present and the future.

Having thus spoken of the *manner* in which the land was peopled, and of the *races* which occupy it, it remains to allude briefly to the *land itself*.

The area of California is nearly equal to that of all New England, New York, and Pennsylvania. Its surface, however, is largely mountain and desert. That portion which lies east of the Sierra Nevada Range, and bordering upon Utah, New Mexico, and the Colorado, is nearly all a barren waste. For all available purposes, it might as well be given to the Morimons or the Indians; but to the west, and between that range and the Coast Range and its branches, repose in beauty and grandeur, those great and small valleys that are at once the riches and the hope of the State. These two ranges, and their spurs, constitute the mountains of California. Their main course is parallel with the coast. Between the two, on the north, and on a spur of the *Sierra Nevada*, almost isolated from both, rises up the grand and solitary *Shasta*, piercing the sky with its silvery cone, *three miles high* above the level of the Sacramento, at the head of which it stands, and down the whole length of which it pours its ever melting snows. Except this, the highest peaks of the Sierra do not exceed 10,000 feet. The *Coast Range* nowhere exceeds 8,000 feet—usually not 4,000. *Snow* is always visible from some of the peaks of both, and within a day-light's travel of the valley cities—a refreshing, yet a tantalizing sight to the dweller or the traveller, when wilting under the heat, and choking with the dust of the plains below.

Of the mountains, very few, if any, give evidence of any *volcanic origin*. There are many more indications of the action of water than of fire. The nearest approach to the result of igneous action is seen in the *Buller*, near Marysville, in the Sacramento valley. A small pile of dark and rocky hills, with sharp and ragged peaks, separated twenty-five miles from either

range of mountains. Steam has been said to issue at times from *Shasta*, but no reliance is placed in the report. It is certain that within the memory of present inhabitants, or in any record now to be found, there has been no living volcano.

Yet of warm and even *boiling springs* there are several, some of which, as those in Napa Valley, north of San Francisco, and those near San Jose, to the south, are places of great resort for invalids and seekers of pleasure. The most remarkable of these springs are the *Geysers*, north of those in Napa, and a few miles south of Clear Lake, where, in the bed and upon the banks of a mountain creek, and within an area of ten acres, a hundred springs (more or less,) boil up over the surface, some through fissures in rock, and others through soil. They are of various colors as they are impregnated with iron, or soda, or sulphur, or with two or more combined. I tasted all these different waters within a circle of a few rods. I also saw one fountain flowing with a blue mud, and another with clear and colorless water not two feet from it. They are of different degrees of temperature, some only tepid, while others flow at boiling heat. Eggs were furnished me at the hotel which I boiled in one of these fountains.

The steam issuing from them is considerable, especially in the early morning. From one place, which I attempted in vain to reach, it issued with the noise and volume of an ordinary steamer blowing off at a wharf.

With these springs should be mentioned several cold and sparkling *soda* springs, in various parts of the State, the waters of some of which are bottled and sold in our markets.

Beside these are several *salt* springs, both in the northern and southern part of the State, from which our markets are now supplied. Connected with one in Shasta county, is a feature both unique and useful. From the swamp lands in the vicinity, there bubbles up constantly an *inflammable gas*, which the proprietor has contrived to collect and to appropriate as *fuel* for the manufacture of salt.

There are, also, what are vulgarly termed *tar*

fountains, or more properly fountains of *asphaltum*. One of these I have visited. They are very sluggish in their movement, almost as imperceptible as the growth of a plant. But they do flow, oozing forth with the consistency of tar, and having its smell and appearance. The fluid hardens on exposure, and in its hardened state is taken to market, where some use has been made of it in the manufacture of gas. It burns like Cannel coal. In its fluid state, it is used somewhat by teamsters and others, who, in passing, may have occasion to tar their wagon wheels.

Of lakes, we have but two or three of any magnitude. *Tulare Lake*, at the head waters of the San Joaquin, is only about fifty miles long, narrow and shallow, it being but the sink of the valley, into which flow the surplus winter rains, and a few small streams that have no other outlet. It is the Dead Sea of California, though not salt, and is supposed by some to be the source of the Artesian wells in San Jose valley, which have attracted so much attention both for their number and their volume of water.

The other is *Clear Lake*, in Napa County, a small but beautiful sheet of water, about twenty miles in length, in a wild and secluded district in the northern coast range, but in the heart of some of the best dairy farms in the State.

There are also two or three smaller ones far up among the crests of the Sierras, which the miners have seriously contemplated tapping as reservoirs for mining in the higher hills.

Of rivers there are many. The most important of these are the *Colorado*, on the south-east border, emptying into the Gulf of California, and the *Sacramento* and the *San Joaquin*, with their tributaries, draining the great valleys of the same names, and emptying near each other in *Suisun Bay*, the innermost of the three great bays that connect the heart of the country with the sea. All of these, like the smaller western rivers, are navigable for steamers of greater or less tonnage for several hundred miles.

To the north are Russian and Eel rivers, and

the Klamath, not navigable, and emptying directly into the Pacific, flowing through some of the most beautiful farming land, and some of the wildest and roughest of the mining land in the Coast Range.

Of bays, the *Suisun*, the *San Pablo*, and the *San Francisco*, are the largest, which, in the order in which I have named them, are the broad channels, like great lakes, through which the vast mountain ranges pour their streams to the sea. Beside these, are the *Humboldt*, 200 miles north of San Francisco, and the *San Diego*, 600 miles south, both beautifully land-locked harbors of several miles in extent; and the *Monterey*, 100 miles south of San Francisco—a large indenture, but exposed to the sea.

The forests of the country are mostly on the slopes of the Sierras. Over the foot hills are scattered stunted white oaks. But at an elevation of from 1,500 to 5,000 feet above the valley, the slopes sustain a heavy growth of pine, hemlock, and cedar. South of the Bay of San Francisco, the Coast Range presents an almost unbroken succession of naked and barren mountains, relieved but in few places by belts and crests of forest. North of the Bay these belts and crests become wider and more frequent as they approach Oregon, till they gradually cover nearly the whole country to the water's edge. Nearly up to the Oregon line, these coast forests are almost entirely "*red wood*," which is a species of cedar. North of that line they are nearly all *fir*, and continue such up to the limits of vegetation, beyond Puget's Sound. All over the country the valleys are more or less shaded and beautified by groves of *white oak*, with here and there a cluster of *live oak* lifting up their stately forms, and spreading far out their evergreen branches of shade and beauty. In some of the shore forests, it is not uncommon to meet with trees of large dimensions. In a deep and gloomy woods back of Crescent City, near the northern boundary, I met, every few rods, with trees eight and twelve feet in diameter, and towering up to a giddy height.

But these were saplings compared with the world-renowned "*Big Trees*" I afterward visited

in Calaveras County, on the slope of the Sierras, 75 miles east of Stockton. Of these there are sixty or eighty of various sizes, larger ones measuring from *twenty to thirty feet in diameter* six feet from the base, and stretching up *300 feet in height!* They are a species undiscovered before, and are found only there. An American naturalist has named them the "*Gigantia Washingtonia*." The wood is soft and of fine fibre, and light pink color. It is almost imperishable. Two of the largest now standing have been stripped of their bark—one sixty feet up, and the other 100 feet. The bark was nearly two feet thick, and was taken off in small sections and marked, so as to be set up by means of wire, and exhibited in the Eastern States and Europe, as the shell of a California tree. The trunk of one of them was thrown down, after it was stripped, by means of parallel two inch bores across it, made by four or five men, who were as many weeks in accomplishing it, and who succeeded at last in overthrowing it, only by means of wedges driven into the bores! The top of the stump, six feet from the base, and without the bark, measures twenty-five feet. It is solid throughout. Having been adzed level, and enclosed in an arbor, which opens into a public house, it is used as a floor for cotillion parties. I have been on it, and measured it. More than 2,000 rings have been counted in it. *It was a tree of 200 years' growth when Christ lived upon earth!* One other, called the "Monarch of the Forest," is now prostrate, having burnt hollow, and fallen a long time ago. It measures 110 feet in circumference at its base, and must have stood 400 feet in height!

Undoubtedly, these trees are the greatest vegetable curiosity in nature. Every admirer of the grand in the works of God, will rejoice to know that the soil that bears them is now owned and protected, and the vandalism that has already destroyed two of them, will destroy no more.

Of the valleys, the largest are the Sacramento and the San Joaquin, which join at their base, and present an almost unbroken plain of 400 or

500 miles in length, and of width varying from twenty to sixty miles. This is exclusive of the wide slopes of the Sierras, and of the Coast Range, which are broken by deep gorges cut by the streams; and the whole surface of which is extremely rugged and uneven.

Beside these valleys are many others—some of them large, beautiful, and fruitful, varying in length from ten to eighty miles, and in width from one to ten. Add to these innumerable smaller ravines, and vast tracts of hill country covered with wild oats, in both ranges, and along the whole length of the State, and we have a valley and hill surface for grazing and cultivation, equal, at least, to the Empire and Key Stone States, and capable of sustaining as large a population.

The products of these valleys, both in grains and vegetables, are already widely known. All the ordinary vegetables grow luxuriously, and to an extraordinary size. Grains are grown, equal in size of kernel and quantity to the acre, to those in the best portions of the West—corn excepted. At times, unheard of crops have been gathered, the record of which would seem fabulous. The vine is especially productive, the fruit being uncommonly rich and large. The State could easily be made the vineyard of America. Fruits of all kinds are remarkably fine, especially the pear, the peach, and the apple. The flavor of that on the Atlantic slope may be richer, but in size and appearance it looks contemptible to one fresh from the orchards and fruit stores of California and Oregon.

Of the wild and uncultivated plants, I will mention but one—the soap plant. It is a bulbous plant, and grows to about the size of an ordinary beet. Its remarkable quality is indicated by its name. This is in the bulb, which, when rubbed in water, produces an abundant lather. I have seen native California women using it in their weekly washing, as dependent upon it, and as satisfied with it, as though there was no other soap known. It grows wild and abundantly.

Of wild beasts, we have what is not found in

the East—the mammoth *grizzly bear*. I have seen one said to weigh 1,500 lbs. There are also found the *panther* and the *wild cat*, while the slopes and plains abound with deer, elk, hare, and antelope. In their season, wild fowl are counted by the acre.

Of the *mineral resources* it is not necessary to speak, its gold fields of 500 miles in length, and sixty in width, being acknowledged to be the richest in the world. There is, however, but little silver, lead, or copper. But of *quick-silver* there is in Santa Clara County alone a supply for the world. The *profits* of the New Almaden mine alone are said to be \$1,000 per day! And there are others, as yet unworked, the product of which must eventually make this useful article both abundant and cheap.

Of gold mining it should be remarked, that it is every year changing its character. As the gold in the streams and on the surface is exhausted, the resort is to the hills, following the quartz leads, or tunneling for deep and hidden deposits. This requires capital, so that mining is passing yearly from individuals to companies, and from hand to machinery. This will eventually make it more and more a monopoly of capital, and change the position of the poor from that of proprietors to that of laborers.

Of the *climate* of the State, it may be said in general terms, that it is its chief attraction, it being vastly milder than that of the same latitude on the Eastern shore. But the climate of the coast varies materially from that of the interior. The *wind* in *summer* is from the northwest—raw, shivery, and often laden with *fog*. It rises during the forenoon, and soon puts the warm morning into chills, so that an overcoat and a fire are often comfortable in the afternoon and evening of July and August. But this wind is soon moderated by the sun, so that in the valleys of the interior it becomes only a refreshing breeze, to make their great heat endurable. It prevails from April to October, or during the heat of the interior, and is produced by the heat, which, by rarifying the air, creates a current from the colder sea—cold because of the tides which set down from the frozen north.

The prevailing *wind* of *winter* is from the southeast. This brings the welcome and reviving rains, which, from October or November, till April or May, are divided into the early and the later, as in Palestine. Except on the high mountains, the cold is never intense. It seldom freezes on the coast. Gardens are cultivated all the year near San Francisco. The thermometer seldom falls below 20° above zero in the mountain towns, while even there most of the winter is open and pleasant. Yet the snows are heavy on the high mountains, and are the unfailing supply of the streams during the long, hot drought of summer.

Long and hot, however, as the summer of the interior is, the mornings and evenings are delightful, and the nights are cool. With occasional exceptions, blankets are comfortable, and sleep is refreshing, after the hottest days. This is a great compensation—better than a thunder shower, or a New England north-easter.

The drought of summer is usually about five months long, during which period there is seldom a shower to relieve the heat and dust. But while the grass withers, and the ground bakes and cracks with thirst, the trees retain their verdure, and the crops mature, both of grass and grain. Haying is in May, and harvesting in June; and, owing to the absence of rain, mowing and reaping, and gathering into barns, are performed by the farmer at his leisure, and without alarm to himself, or peril to his crops. Grain, after it is cut, is usually left standing for weeks in the field, and there threshed and bagged for market in the open air.

But there is a liability to failure in the crops, both of grains and vegetables, except where the farmer can irrigate his fields. This liability is owing to the occasional failure of the winter rains—a calamity which has been known to befall the country for three successive winters. This has been the case to a great extent of late, in the southern portion of the State. The result has been, the starvation and death of thousands of cattle, and the failure of all the crops not sustained by irrigation. The country

therefore, will be subject to famines, until, by canals from the never-failing streams, and by artesian wells, and windmills, the means of irrigation, which are abundant, shall supply, when needed, the place of rain. And this system of irrigation would not only secure crops on land which did not usually require it, but would also redeem a vast quantity of rich land, both in the valleys and on the slopes, which, on account of the drought, is now useless.

Vast tracts of wild oats grow up to the Coast Range, the dry tops and the fallen grain of which afford the best of pasturage when the grasses of the valleys are brown and withered. Then the mingled brown, and green, and yellow, both of the hills and valleys, present a most singular, yet beautiful appearance, and from any hill top, present a view scarcely less lovely than when the whole is robed in the beauty of spring.

To this spring beauty the *wild flowers* give the sweetest charm. They abound everywhere, and are of every hue and form, from the modest violet to the gorgeous poppy. In the season of flowers, few countries offer so many attractions to the florist. Nowhere have I seen *cultivated* flowers reach such perfection. The rose especially, that queen of flowers, blooms there in her glory.

Of *Oregon* and *Washington* I have no time to speak, though a whole lecture might profitably be devoted to them. They differ not essentially from California either in soil or climate. In *area*, Oregon is smaller, but Washington larger; and the latter is larger than all New England, New York, and New Jersey. In *surface* they are equally mountainous, but have less desert. Like California, however, they are divided by two parallel ranges of mountains, the Coast Range and the Cascades. These wall up large and beautiful valleys, and send down through deep chasms, and over wide plains, and into large bays and sounds, or directly into the sea, precipitate mountain torrents, or placid and navigable streams.

On the east of the Cascades are the ranges of the Blue and Rocky Mountains, enclosing a

vast wild country of rolling hills, and abounding in powerful and hostile tribes of Indians, and in innumerable wild horses, cattle, game, and beasts of prey.

Both Territories are better wooded and watered than California, and are better adapted to agricultural pursuits. The valley of the Willamette, in Oregon, is decidedly the best on the Pacific Coast. It is about 125 miles long, and fifty miles wide, including the slopes of the Cascades, and of the coast, which are arable to their tops.

Both Territories have loftier and greater mountains and *nobler rivers*. The Columbia that in part divides the two, though navigable for a less distance than the Sacramento, presents to the traveler scenes of mingled beauty and sublimity far superior—indeed some that are inferior to no other. For grandeur, nothing can excel the pallisades and towers, and frowning battlements, and piercing fir-capped cones, and dashing rapids, and plunging waterfalls of the *Dalles* and the *Cascades*.

Oregon lacks good harbors; the shifting sands of the bar of the Columbia, and the heavy breakers rolling and raging over the channel during several months of the year, as well as the fogs that frequently shut out of view the land marks and buoys, rendering its passage uncertain and hazardous, except by steam.*

But *Washington* has safe and accessible anchorage for the fleets of the world. *Puget's Sound* has few equals as a magnificent inland sea. Surrounded by dense forests which are only broken by rich and beautiful prairies, it reposes in the very heart of the Cascade slope, and by its easy entrance, its broad sweep of 200 miles from its mouth, its wide channels, its numerous inlets, which, with few exceptions, afford anchorage to the very shore, it impresses every traveler with its future importance. A tour through that country a year and a half since

* This is only partially true.—the surveys of Lieut W. A. Bartlett, U. S. N., having indicated the channel to be one adapted to the largest shipping, and safe at all seasons. Ignorance on this subject has probably tended to retard the commercial development of the adjacent countries more than any other cause.—*Ed.*

satisfied me that its great commercial importance was only a *question of time*.

The *climate* of both Territories is mild, though colder and wetter than California. The rivers sometimes freeze over, though only for a short time. Stock are never housed, though fed during a month or two in the winter.

Their *productions* are similar to those of California, except those of its southern and tropical portion. Both of them are *sparsely populated*—Oregon containing about 40,000,* and Washington 5,000† souls. The towns in both are small, Portland the largest in Oregon, containing less than 1,500, and Olympia, the largest in Washington, less than 400. Both countries are retarded in their growth by *hostile Indians*. Both suffer materially for *want of a market* for their produce—California being their principal outlet except for timber, some of which is sold in China and the East Indies. This is a serious drawback to the progress of the whole coast.

Both Territories have more or less of the *precious metals* of California, though to what extent is not yet known. Both have also what California has not—extensive *Coal* mines, of the richness of which we know but the beginning. Both, also like California, have an *important future*. Their development may be slow, but it will be sure. Already the foundations are laid there of education and religion, and of good law and commercial greatness. Churches, academies, and even colleges, are already there, and among a people *settled* with their children upon the soil. If the noble men now struggling there can preserve the liberties of the territory from the slavery plotters of the South, who are now politically active and dominant,‡ (and we believe they can) our very best institutions will be established there, to bless and enrich the millions that are yet to crowd those hills and vales.

* In 1853 the population by census counted 33,324, and in 1858, 42,862. In the same years the valuation of taxable property was \$4,578,033 and \$18,463,372. See "Journal" for Feb., 1859, p. 62.

† The census of Washington in 1853 gave 3,965 inhabitants.

‡ Active; but not *dominant*.—Ed.

In conclusion, I would say that the whole Pacific Coast promises well for its future population. The *position* of those great Territories, with their great resources, their splendid harbors, fronting on the world's greatest ocean, and over against the world's oldest and most populous nations, is indicative of their destiny. They are at present occupied by a race unsurpassed in general intelligence, energy, and ambition, while *everything* in the climate and the physical aspects of the country favors the production of as manly and vigorous a race as ever had committed to them responsibilities so great.

California has been called the *Palestine of the Pacific*. And the term has not been inaptly applied. In climate, soil, and productions; in the general appearance both of the hills and valleys; in the dews and rains and everlasting snows; in the wild flowers and fruits, and "the cattle on a thousand hills," as well as the seasons that divide the year, there are resemblances that impress every traveler that visits both. By the providential concealment of the gold till the land was in the possession of a Christian and Protestant people, and then by the discovery so rapidly peopling it, mainly from the *North and East*, and so securing it to *freedom* as well as to a pure religion, can we not trace the resemblance *still further*, and hope at least that it may also be a *Holy* land, whose chosen people shall, from their commanding position, go forth to *bless every other*.

ASTRONOMICAL POSITIONS.

At the monthly meeting of the Chicago Historical Society, held on the 19th April, 1859, the following latitudes and longitudes of places were announced by Col. J. D. Graham, as having been recently determined by him from Astronomical Observations, viz.:

	Long.	
	Lat. N.	W. of Greenwich.
1. Chicago—Dome of Ct. House.....	41° 53' 06".2	87° 38' 01".2
2. Michigan City, Ind.—Top of a sandhill N.E. from R.R. Dpt.	41° 43' 25"	86° 54' 21".15
3. Waukegan, Ill.—The dome of the Court House	42° 21' 43".7	87° 50' 10".65

DEPARTMENT OF STATISTICS.
ON THE MANNER OF TAKING A
CENSUS.

To the Committee of Publication

of the Am. Geo. and Stat. Society:

GENTLEMEN,—In my last letter, I noticed some of the difficulties that must be met with under the most favorable circumstances, in obtaining a census. Others, arising from foreign languages, remoteness from other settlements, difficulty of access, absence from home, and similar causes, will try the patience and energies of the Census Marshals, but may be overcome by proper industry, and the aid of interpreters and other persons familiar with localities and their affairs generally. The person appointed for obtaining the statistics should be always a resident of the district he is to canvass, and, as far as possible, acquainted with its inhabitants and their general pursuits.

It will sometimes be found that people are unwilling to return the statistics of their business for the census, just as they sometimes refuse their names for a directory; and that under an apprehension of taxation, or fear that a rival may be excited, or a competitor informed, or a creditor alarmed by a minute statement of their affairs, the required statistics will be denied; and if obtained, must be had from other parties, or be founded upon extremely uncertain and indefinite data. More frequently, however, the Marshal will notice a tendency to over-rate or under-estimate the statistics of business, from the motives just stated, as every Assessor must have observed in his official duties, as he met persons anxious to figure high or low upon his rolls.

These evasions or perversions of the law are exceptional, rather than general, and in most cases arise from a misconception of its spirit. Every return made for the census should be considered as *under a pledge of secrecy*, and should be given and received with the confident assurance, that the facts were to appear only in the general summaries—that in no event should the items be made the basis of taxation, and

that under no circumstances should other persons be allowed to use or examine the particular statements made, except for summary and classification. Such is unquestionably the intention of the law, and it has been thus expressly announced in the official instructions of the last federal and New York State censuses. As a further guaranty, it should be incorporated in the statute, and its observance, on the part of the Census Marshals, should be enjoined by law, as it now is by honor.

It is usual to attach penalties for refusing to answer the questions proposed in the schedules of the census, or for wilfully mis-stating facts, but prosecutions for such refusal or evasion have been extremely rare; if, indeed, they have ever occurred in this country. In a single instance, such a prosecution was begun, in 1855, in New York, but the proceedings were dropped before the case came up for trial. That such penalties are salutary, and even necessary, there can be no doubt; but to be effective, their prosecution should follow with certainty, and their amount should not be so great as to appear too severe and oppressive, or as to excite sympathy for the accused, and thus lessen his chances of conviction.

Were the confidential character of the census returns generally and properly understood, and to this end made prominent in the statute, the motive for concealment or evasion would mostly cease, and an important difficulty in the way of obtaining the elements for a correct classification of national statistics, would be removed. The most effective means for obtaining accurate returns of industrial pursuits must be, to circulate widely, and to bring within the personal knowledge of every one, a list of the inquiries which will be made, a sufficient time before the enumeration begins to allow answers to be prepared and ready for the Census Marshals. The expense of furnishing blanks, prepared for the purpose, to each manufacturer and extensive producer, several days before they are to be called upon for returns, would greatly enhance the accuracy of the industrial census, and expedite the labors of those

employed in obtaining it, even were he required to pass twice over their district, in distributing and collecting the schedules. Those who have been engaged as census takers, will readily appreciate the relief that would have been afforded them, had the persons from whom they received information been prepared with full statements, ready for their use; and few persons, who have experienced the delays and inconvenience attending the procuring of facts concerning agriculture and manufactures, from families and persons who had made no preparation for giving them, would not prefer, for the same compensation, to go twice over their district, if assured that no delays were to attend their visits. The chances of omission of important items, through inadvertence, would be greatly reduced, the inconvenience of finding persons temporarily absent would be lessened, and actual results from accounts and other records would, in many instances, take the place of impromptu estimates.

The simultaneous enumerations of Europe, which refer to, and are often made in a single day, render such schedules for single families necessary. We have never been able to execute the work in so brief a period, and methods for shortening the process are still among the things to be earnestly desired, and if possible, obtained. May it not be well to inquire whether such a previous distribution of inquiries, to be filled up by families and individuals, would not greatly abridge the labor and enhance the accuracy of the census? Were it to effect but one of these objects, it would abundantly repay the few hundred reams of paper which it would require for the nation, and relieve this great enterprise from many of the anomalous, absurd, and contradictory features which necessarily appear on almost every page of the returns; perhaps without fault of any party, but rather from the misfortune of being called upon without preparation for the details of a business extending through many ramifications, and complicated with many interests which can only be analyzed and adjusted by patient investigation and careful computation.

Respectfully yours,

FRANKLIN B. HOUGH.

ALBANY, March 18, 1859.

STATISTICS OF AMERICAN STATES.

NO. 5.

REPUBLIC OF BOLIVIA.

Lat. 10° 21' to 25° 38' S. Populat'n (1855) 2,326,126.
Long. 57° 34' to 70° 42' W. Density, 4.91 to sq. mile.
Area, 473,298 sq. miles. Capital, CHUQUISACA.

GOVERNMENT.

Executive.—President, (formerly chosen for life,) elected for six years.

Administration.—1. Minister of the Interior and Religion; 2. Minister of Finance and Police; 3. Minister of Foreign Affairs and Public Instruction; and, 4. Minister of War.

Legislature.—Three Chambers—that of Senators, that of Tribunes, and that of Censors.

Judiciary.—A Supreme Court at the capital; provincial courts in the chief provincial towns, and courts of inferior jurisdiction in districts and parishes. Also ecclesiastical courts.

National Religion.—The Holy Apostolic Roman Catholic. The Church is under the immediate supervision of the Archbishop of Charcas or Chuquisaca, and of the Bishops of Cochabamba, Santa Cruz de la Sierra, and La Paz de Ayacucho.

HEIGHTS OF BOLIVIAN ANDES.

	Lat. S.	Long. W.	Hgt. ft.
Sorata.....	15° 41'	68° 36'	21,296
Illimani (<i>illi</i> , snow)....	16° 46'	67° 47'	21,252
Chachacomani.....	16° 08'	68° 22'	20,235
Supaiwasi or Huayna			
Potosi Peak.....	19° 26'	65° 43'	20,167
Mesada Nevada.....	16° 32'	67° 52'	19,356
Angel Peak.....	16° 10'	68° 14'	19,061
Cacaca.....	16° 28'	69° 02'	18,210
Cololo.....	14° 57'	69° 12'	17,932
Chorolque.....	20° 47'	65° 51'	16,548
Lake Titicaca.....	15° 40'	67° 30'	12,795
Mean height of B. Andes.....			13,502

HEIGHTS OF PASSES IN BOLIVIAN ANDES.

	Feet.
Tolapalca—from Potosi to Oruro.....	14,196
Condur Pacheta— " ".....	14,040
Pacuani—from La Paz to the Beni.....	15,349

RIVERS OF BOLIVIA.

Flowing into the Pacific.—Lara, on the Peruvian border, and Frio, on the Chilean border, between which is the Desert of Atacama.

Flowing through the Amazon and the Paraguay, into the Atlantic.—Purus, Beni, Mamore, Blanco or Ubai, and Guapore; and Vermejo, San Juan, Pilcomayo, etc. The Paraguay forms the eastern boundary.

Flowing into and lost in Lakes.—Desaguadero, the outlet of Lake Titicaca, emptying into L. Aullagos; Jauca, into L. Chipaya; Catalina, into the lake of the same name. Several small streams empty into L. Titicaca.

NATURAL PRODUCTIONS.

1. *Mineral.*—Gold, silver, copper, lead, tin; saltpeter, sulphur, salt; precious stones, etc.

2. *Vegetable.*—Timber of various descriptions; cabinet woods; dye woods, gums, and drugs; Peruvian bark; sarsaparilla, sassafras, and ipecacuanha; India rubber; copaiba, and other balsams; all of which are of spontaneous growth. The principal cultivated products are—cocoa, coffee, cotton, rice, sugar-cane, ginger, tobacco; potatoes, Indian corn, wheat, barley, and other cereals; coca, a narcotic, largely used by the Indians.

3. *Animal.*—Skins—chinchilla, tapir, jaguar, llama, and alpaca; hides and horns of horses and cattle; tortoise shell; wax and honey, etc. The rivers abound in fish.

AREA AND POPULATION.

Departments	Area, sq. m.	Population.	Capitals.
Chuquisaca	29,143	226,387	Chuquisaca.
La Paz	36,418	352,179	La Paz.
Potosi	37,227	301,222	Potosi.
Oruro	25,842	121,890	Oruro.
Cochabamba	31,621	292,876	Oropesa.
Santa Cruz	136,235	694,877	San Lorenzo.
Beni	112,482	224,877	Apolobamba
Provinces			
Cobija	37,069	21,791	Cobija.
Tarija	31,218	90,384	Tarija

Total 473,293 2,326,126

Of the population, about 60 per cent. are Indians, 30 per cent. Mestizos or mixed Indian and Spanish, and 10 per cent. the descendants of Spaniards. The few negroes on the coast will scarcely vary these proportions. In Santa Cruz and Beni, the whole population is Indian, and is only nominally connected with the Bolivian government.

Chuquisaca, the capital, has 19,200 inhabitants, and the other most populous towns are—La Paz de Ayacucho, with 42,850 inhabitants; Oropesa, with 34,000; Potosi, with 30,000; Oruro, with 6,000; San Lorenzo, with 6,000; Tarija, with 4,000; and Cobija, with 2,000.

STANDING ARMY.

Artillery, (22 guns)	250 men
Infantry	2,000 "
Cavalry	1,500 "

Total force 4,150 "

COMMERCE AND NAVIGATION.

1 Value of Exports and Imports, (1853)			
Exports	Gold and silver		\$777,680
	Copper ore.....qqts	595,425	
	Alpaca wool....."	1,560	
	Chinchilla skins.....doz.	1,800	
	Guanaco.....tons	20,450	
	Other merchandise		645,096

Total \$1,422,716

Imports	Liquors and wines	\$49,307
	Woolen goods	523,112
	Cotton goods	659,242
	Other merchandise	127,924

Total \$1,359,585

2 Navigation, (1853)

Flag.	Entered.	Cleared.	Total.
English	6,150	4,800	10,450
Chilean	3,900	1,170	5,370
Spanish	800	260	1,060
United States	1,970	1,970	3,940
Peruvian	800	390	1,190
Sardinian	625	80	705

Total (tons).....11,215 8,470 22,715

3 Commerce with United States

(From "U. S. Com. and Nav." Tables, 1849-1858.)

Year.*†	Exports from U. S.	Imports into U. S.	Total Commerce
1852.....	\$210,705		\$210,705
1853.....	41,572		41,572
1854.....	12,373	\$35,658	51,031

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Year†	Am. Tonnage		For Tonnage		Total	
	Enter'd the U. S.	Clear'd from U. S.	Enter'd the U. S.	Clear'd from U. S.	Enter'd the U. S.	Clear'd from U. S.
1849.....	1,041	189	487	125	1,529	314
1850.....	846	887	1,280	370	2,126	1,257
1851.....	343	189	254	129	637	314
1852.....		646				646
1853.....		277		225		277
1855.....		657				657
1858.....		333		279		333 279

NATIONAL FINANCES.

1 Revenue Account.

Receipts (1850, latest date accessible).....	\$1,976,217
Expenditures (same year).....	1,739,744

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Debt, stated in 1847.....	\$2,181,216
Interest, at 6 per ct. to 1859 (12 years)....	2,307,849

Total debt bearing interest.....	\$4,389,819
Debt (bonds of 1847-9) not bearing int'l....	2,654,914

Total debt in 1859.....\$7,044,797

WEIGHTS, MEASURES AND MONIES.

Old. Spanish system.

New.—French metrical system. [R. S. P.]

* *Nid.* 1849, 1850, and 1851

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WEIGHTS, MEASURES AND MONEYS.

Old.—Spanish system.

New.—French metrical system. [R. S. F.

* Nil, 1849, 1850, and 1851.

† Nil, 1854, 1856, and 1857.

ELEMENTARY STATISTICS OF EUROPEAN STATES.

No. 2.

LAND AND NAVAL FORCES.

1.—Land Forces of the Several States on the Ordinary Footing.

States.	Date of Return.	Regular Army.					German Contingent Army.	Expenditures of War Department.*
		In-fantry.	Cav-alry.	Ar-tillery.	Others.	Total Force.		
Andorre .....	..	50	50	....	....	100	....	\$10,000
Anhalt-Bernburg .....	..	555	....	....	....	555	555	60,000
Anhalt-Dessau-Koethen .....	..	640	640	....	....	1,280	1,280	148,000
Austrian Empire	1858	238,456	67,672	32,817	67,391	396,436	142,233	50,722,818
Baden	"	11,180	1,870	1,764	1,853	16,667	15,000	850,000
Bavaria	"	62,112	9,104	12,525	3,476	88,227	53,400	3,630,360
Belgium	"	56,550	8,202	6,700	2,266	73,718	....	6,622,400
Bremen	"	760	....	....	....	760	673	120,924
Brunswick	"	2,106	370	244	....	2,720	3,144	326,795
Denmark	"	13,812	5,940	2,168	3,992	25,912	5,400	4,625,072
Frankfurt	1857	783	....	....	....	783	719	177,213
French Empire	1858	247,641	65,407	34,262	61,752	409,062	....	70,808,404
Great Britain, etc.	"	172,835	21,627	21,839	6,573	222,874	....	62,509,355
Greece	1857	6,712	327	363	2,284	9,686	....	823,516
Hamburg	1858	1,947	....	....	....	1,947	1,947	200,000
Hanover	1857	20,404	3,078	2,666	730	26,938	19,581	1,811,948
Hesse-Cassel	1858	5,964	1,980	1,063	372	9,379	8,519	788,011
Hesse-Darmstadt	1857	8,068	1,291	1,088	174	10,621	9,293	892,167
Hesse-Homburg .....	..	333	....	....	....	333	300	42,000
Holland	1857	43,688	4,490	8,867	1,450	58,495	2,435	4,611,681
Ionian Islands	1856	....	....	....	....	....	....	....
Lichtenstein	1858	70	....	....	....	70	82	10,000
Lippe-Detmold	1857	640	320	....	....	960	1,082	120,000
Lubeck	"	475	....	....	....	475	711	30,327
Mechlenburg-Schwerin	1856	4,216	672	403	89	5,380	5,370	563,000
Mechlenburg-Strelitz	"	640	320	117	....	1,077	1,077	112,000
Modena	1857	....	....	....	....	5,928	....	542,000
Monaco .....	..	50	....	40	....	90	....	15,000
Nassau	1858	4,941	....	480	117	5,498	5,498	620,000
Oldenburg	"	2,909	460	369	....	3,738	3,366	410,000
Parma	"	3,191	79	157	236	3,663	....	391,000
Portugal	"	14,739	2,362	1,533	6,560	25,194	....	3,333,694
Prussia	1857	86,414	58,972	11,208	5,712	162,306	120,392	21,166,227
Reuss-Greiz .....	..	609	....	....	....	609	....	82,000
Reuss-Schleitz .....	..	260	....	....	....	260	1,117	31,009
Roman States	1858	13,352	670	802	4,431	15,255	....	2,025,237
Russian Empire	1857	322,672	162,907	51,608	40,772	577,859	....	56,716,187
San Marino .....	..	90	....	....	....	90	....	5,000
Sardinia	1858	30,499	5,211	4,053	8,152	47,915	....	6,742,841
Saxe-Altenburg	1857	1,474	....	....	....	1,474	1,474	147,400
Saxe-Coburg-Gotha	"	1,860	....	....	....	1,860	1,674	167,400
Saxe-Meiningen	"	1,726	....	....	....	1,726	1,726	182,600
Saxe-Weimar-Eisenach	"	2,345	....	....	....	2,345	3,105	234,500
Saxony	"	15,763	3,208	2,430	5,237	26,628	18,000	1,538,722
Schaumburg-Lippe .....	..	315	....	....	....	315	315	31,500
Schwartzburg-Rudolstadt .....	..	640	320	160	70	1,190	899	119,000
Schwartzburg-Sondershausen .....	..	676	....	....	....	676	676	67,600
Spain	1851	143,742	11,927	11,132	33,600	200,401	....	17,119,993
Sweden	1857	34,537	4,192	2,468	7,621	48,718	....	2,777,796
Norway	"	11,924	1,070	1,330	9,160	23,484	....	1,138,972
Switzerland	"	61,866	1,934	2,801	5,324	71,925	....	557,406
Turkey	1857	72,355	18,000	11,600	47,545	143,500	....	12,017,500
Tuscany	1858	11,986	258	2,218	2,743	17,205	....	1,375,279
Two Sicilies	1856	74,814	8,570	6,322	2,880	92,586	....	9,018,405
Waldeck .....	..	779	....	....	....	779	779	77,900
Wurtemberg	1858	6,159	1,972	1,316	446	9,893	20,923	1,312,918
Total		1,823,324	475,472	238,813	333,008	2,870,617	452,745	\$360,594,073

STATISTICS OF EUROPEAN STATES—CONTINUED.

2.—*Naval Forces of the Several States.*

States.	Sail.		Steam.		Total.		Personnel.		Expenditures of Navy Department.*
	Ves-sels.	Guns.	Ves-sels.	Guns.	Ves-sels.	Guns.	Sea-men.	Ma-rines.	
Andorre .....	..	..	..	..	..	..	..	..	..
Anhalt-Bernburg .....	..	..	..	..	..	..	..	..	..
Anhalt-Dessau-Koethen .....	..	..	..	..	..	..	..	..	..
Austrian Empire	113	557	22	295	135	852	3,340	3,199	\$2,722,171
Baden .....	..	..	..	..	..	..	..	..	..
Bavaria .....	..	..	..	..	..	..	..	..	..
Belgium .....	..	..	..	..	..	..	..	..	431,170
Bremen .....	..	..	..	..	..	..	..	..	..
Brunswick .....	..	..	..	..	..	..	..	..	..
Denmark	104	740	12	192	116	932	1,471	265	2,094,799
Frankfurt .....	..	..	..	..	..	..	..	..	..
French Empire	252	8,106	209	4,414	461	12,520	36,629	19,987	28,109,707
Great Britain, etc.	364	8,956	454	7,782	818	16,738	41,860	15,109	89,975,604
Greece	21	127	5	22	26	149	683	..	276,962
Hamburg .....	..	..	..	..	..	..	..	..	..
Hanover .....	..	..	..	..	..	..	..	..	..
Hesse-Cassel .....	..	..	..	..	..	..	..	..	..
Hesse-Darmstadt .....	..	..	..	..	..	..	..	..	..
Hesse-Homburg .....	..	..	..	..	..	..	..	..	..
Holland	110	1,594	34	332	144	1,926	5,945	1,795	3,199,051
Ionian Islands .....	..	..	2	5	2	5	36	..	160,000
Lichtenstein .....	..	..	..	..	..	..	..	..	..
Lippe-Detmold .....	..	..	..	..	..	..	..	..	..
Lubeck .....	..	..	..	..	..	..	..	..	..
Mechlenburg-Schwerin .....	..	..	..	..	..	..	..	..	..
Mechlenburg-Strelitz .....	..	..	..	..	..	..	..	..	..
Modena .....	..	..	..	..	..	..	..	..	..
Monaco .....	..	..	..	..	..	..	..	..	..
Nassau .....	..	..	..	..	..	..	..	..	..
Oldenburg .....	..	..	..	..	..	..	..	..	..
Parma .....	..	..	..	..	..	..	..	..	..
Portugal	33	356	6	13	39	369	2,181	612	941,664
Prussia	49	188	6	77	55	265	1,316	618	430,077
Reuss-Greitz .....	..	..	..	..	..	..	..	..	..
Reuss-Schleitz .....	..	..	..	..	..	..	..	..	..
Roman States	11	15	3	8	14	23	400	..	200,000
Russian Empire	85	1,518	73	1,703	158	3,221	11,920	6,462	21,189,912
San Marino .....	..	..	..	..	..	..	..	..	..
Sardinia	13	170	16	296	29	466	2,922	364	934,753
Saxe-Altenburg .....	..	..	..	..	..	..	..	..	..
Saxe-Coburg-Gotha .....	..	..	..	..	..	..	..	..	..
Saxe-Meiningen .....	..	..	..	..	..	..	..	..	..
Saxe-Weimar-Eisenach .....	..	..	..	..	..	..	..	..	..
Saxony .....	..	..	..	..	..	..	..	..	..
Schaumburg-Lippe .....	..	..	..	..	..	..	..	..	..
Schwartzburg-Rudolstadt .....	..	..	..	..	..	..	..	..	..
Schwartzburg-Sondershausen .....	..	..	..	..	..	..	..	..	..
Spain	149	948	41	305	190	1,153	12,019	4,565	5,133,617
Sweden	394	2,301	22	298	416	2,599	..	..	1,782,842
Norway	134	343	8	107	142	450	..	..	544,500
Switzerland .....	..	..	..	..	..	..	..	..	..
Turkey	54	692	17	156	71	848	36,000	3,000	2,622,000
Tuscany .....	..	..	..	..	..	..	..	189	..
Two Sicilies	66	668	32	164	98	832	3,150	922	2,108,432
Waldeck .....	..	..	..	..	..	..	..	..	..
Wurtemberg .....	..	..	..	..	..	..	..	..	..
Total (18 states)	1,952	27,179	962	16,169	2,914	43,348	159,872	57,087	\$162,857,161

* These amounts are the total expenses of the War and Navy Departments for the years named; and include not only the cost of the support of the forces, but also of their accumulation, manufacture, repairs, equipment, manning, etc.

[R. S. F.]

PUBLIC DEBT OF FRANCE.

The evil of excessive expenditure in times of peace is strikingly illustrated in the history of the French national debt.

At the conclusion of the war in 1814, the public debt of this nation amounted only to 1,266,152,700 francs, the annual charges upon which were only 63,307,600 francs.

The Bourbons occupied the throne from the downfall of the first Napoleon for sixteen years, until 1830. When they fell, the public debt stood at 4,426,724,425 francs, and the annual charge at 199,417,200 francs. The expenditures during these years had, therefore, exceeded the ordinary income of the nation in the amount of 3,160,571,725 francs, or upon an average of each of the sixteen years included in the sum of 197,535,733 francs.

Louis Philippe commenced his reign with an annual charge for the public debt, exceeding that of 1815 by no less than 136,109,600 francs. Did he benefit by the lesson which the administration of the finances by the Bourbons should have taught him? We have no precise account of the state of the capital of the public debt when he abdicated; but an official account gives the annual charge in 1848 at 244,287,200 francs, being an increase during his reign, of 44,870,000 francs—showing that on an average of the whole eighteen years during which he occupied the throne, the expenditures must have exceeded the ordinary income by about 85,000,000 francs a year.

The first accounts published after the abdication of Louis Philippe, show that on the 1st January, 1851, the public debt stood at 5,345,637,360 francs. Since this period we have the annual statements, which exhibit an increase unprecedented in French annals. They are, year by year, as follows:

1st Jan.	Absolute debt.	Annual increase.
1851.....	5,345,637,360 fr.	.....
1852.....	5,516,194,600 "	170,557,240 fr.
1853.....	5,577,504,586 "	61,309,986 "
1854.....	5,669,655,012 "	92,150,426 "
1855.....	6,082,877,852 "	413,222,840 "
1856.....	7,558,040,822 "	1,475,162,970 "
1857.....	8,031,992,466 "	1,473,951,644 "
1858.....	8,422,096,777 "	390,104,311 "


This table shows that in seven years the public debt of France has increased by no less than 3,076,459,417 francs, or at the rate of 439,949,202 francs a year. No doubt this period includes the two years of the Russian war; but even if we deduct 1,500,000,000 francs for the loans applied to that purpose, there is still an increase for the period of 1,576,459,417 francs, or at the rate of 225,208,488 francs a year. The annual charge on the present debt is 310,880,000 francs.

Thus the broad fact is before us, that from 1814 to 1858, a period of forty-four years, of which only two were years of war, the public debt of this nation has been increased from 1,266,152,700 to 8,422,096,777 francs; and the annual charges thereon to be provided for by taxes, from 63,307,600 to 310,880,000 francs.

By this means only—this constant accumulation of debt, or annual anticipation of the ability of the productive forces of the people—has the "*equilibrium of income and expenditure*," as it is called, been maintained, and the balance struck on the national ledger. And thus, while the country is unable to sustain its present burden, every year is rendering it less capable of surmounting the difficulties under which it labors, or of sustaining further demands.

The absolute amount of a nation's debts, however, is not the true test of its financial condition. The ability to meet the demands on the public treasury must be taken into consideration. The measure of confidence due to national ability is expressed by financial men on the public exchange; and hence, while the three per cents. of France are quoted at 68 or 69, the English Consols stand at 95 or 96, and the United States loans, and the bonds of several of the States of this confederacy, are quoted at a premium.

That France has forestalled the whole of its immediate resources, is now apparent. The panic which has prevailed in Paris since the possibility of a war with Austria, must have sufficed to convince the imperial authorities that it is the last straw heaped upon the camel's back that weighs it to the earth.

 HENRY GRINNELL, Esq., Vice-President of the American Geographical and Statistical Society, and the eminent patron of the "Arctic Expeditions under Dr. Kane," has recently been elected an Honorary Member of the Imperial Geographical Society, (*K. K. Geographische Gesellschaft*) of Vienna.

DEPARTMENT OF PUBLICATIONS.

BOOKS, MAPS AND CHARTS, ETC.,
Purchased or donated since last Report.

BOOKS ADDED BY DONATIONS.

- RAILROADS**—(*Presented by John H. Schultz, Esq.*)
—American Railroad Journal. Henry V. Poor, Editor. For the years 1849, '50, '51, '52, '53, '54, '55, '56, '57 and '58. New York: John H. Schultz & Co., Publishers. 10 vols., 4to.
MECHANICS—(*Presented by Hon. James Harlan.*)
—Patent Office Report for 1857. 3 vols., 8vo.
AGRICULTURE—(*Presented by the State of Indiana.*)
—Annual Reports of the Indiana State Board of Agriculture, for the years 1852, '53, '54 and '55. 4 vols., 8vo., h'bd.
VERMONT REPORTS—(*Presented by the State of Vermont.*)
—Vermont Board of Education: 1st and 2d Annual Reports. Burlington, 1857 and '58. 2 vols., 8vo., pp. 98, 84.
—Natural History of the State of Vermont: Preliminary Report on. By Augustus Young, State Naturalist. Burlington, 1856. 1 pamph., 8vo., pp. 88.
—Life and Services of Matthew Lyon: An Address before the Vt. Hist. Society. By Pliny H. White; 1858. 1 pamph., 8vo., pp. 26.
—The Marbles of Vermont. 1 pamph., 8vo., pp. 16.
—Report on the Geological Survey of Vermont. By E. Hitchcock; 1858. 1 pamph., 8vo., pp. 14.
—The Acts and Resolves passed by the General Assembly of Vermont in 1858. 1 vol., 8vo., pp. 238, h'bd.
—Report of the Vermont Bible Society at its 46th Annual Meeting; 1858. 1 pamph., 8vo., pp. 20.
—Message of the Governor of Vermont in 1858. 1 pamph., 8vo., pp. 13.
—Report on the Artificial Propagation of Fish. By George P. Marsh; 1857. 1 pamph., 8vo., pp. 106.
—Catalogue of the Vermont State Library. 1 pamph., 8vo., pp. 64.

- Journal of the House of Representatives of Vermont, (containing the 1st Annual Report of the Railroad Commissioners,) for 1856. 1 vol., 8vo., pp. 821, h'bd.
—Public Accounts of the State of Vermont: Annual Reports of the Auditor for 1850, '51, '52, '53, '54, '55, '56, '57 and '58. 9 pamphls.
—Railroad Commissioners: 2d and 3d Annual Reports of. 1857 and '58. 2 pamphls., 8vo., pp. 164, 132. (*1st Report—See Journal of the H. of Reps. for 1856.*)
AGRICULTURE—(*Presented by the Society.*)
—Report of the Franklin County Agricultural Society for the year 1858: 9th Annual Report. 1 pamph., 8vo., pp. 112.
SCIENTIFIC—(*Presented by the Smithsonian Institution.*)
—Smithsonian Contributions to Knowledge. Volume X. 1 vol., 4to.
IOWA REPORTS—(*Presented by His Excellency, Rudolph P. Lowe, Gov. of the State.*)
—Census Returns of Iowa for 1856. 1 vol., 8vo., pp. 426, paper.
—Iowa State Agricultural Society: 4th Annual Report, for 1857. 1 vol., 8vo., pp. 458, paper.
PUBLIC HEALTH—(*Presented by H. N. Camp, Esq., and Hon. Geo. W. Pratt.*)
—Mr. Ely's Report on the Sanitary Condition of the City of New York. 1 pamph., 8vo., pp. 211. (2 copies.)
EDUCATION—(*Presented by Frederick Prime, Esq.*)
—Report of Committee appointed to secure the Establishment and Government, etc., of the Common Schools in the City of New York. Albany, 1859. 1 vol., 8vo., pp. 1,192, paper.
—Second Report on the Common Schools of the City of New York; 1859. 1 pamph., 8vo., pp. 36.
FOREIGN MISSIONS—(*Presented by the B. of C. for For. Missions.*)
—The Missionary Herald: 9 numbers to complement volumes, and the numbers for Jan., Feb., March, April and May, 1859. Boston. 14 pamphls., 8vo.
EDUCATION—(*Presented by the Publishers.*)
—Ohio Journal of Education for April, 1859.
—Rhode Island School-Master for April, 1859.
UNIVERSITY REPORT—(*Presented by the Hon. F. A. Conkling.*)
—Seventy-second Annual Report of the Regents of the University of the State of New York, 1859. 1 vol., (unbound,) 8vo., pp. 247.
N. Y. STATE CANALS—(*Presented by the Hon. F. A. Conkling.*)
—Annual Report of the Auditor of the Canal Department, on the Tolls and Tonnage of the Canals of the State of New York. 1 pamph., 8vo., pp. 36.

- ESSEX INSTITUTE—(*Presented by the Institute.*)
 —Historical Collections of the Essex Institute.
 Vol. 1, No. 1; April, 1859. 1 pamph., 8vo.,
 pp. 32. (*Same form and size of this Journal*)
 MERCHANTS' MAGAZINE—(*Presented by R. S.*
Fisher, M. D.)
 —Hunt's Merchants' Magazine for Dec., 1853,
 and Feb., March and May, 1855. 4 pamphs.,
 8vo.
 GEOGRAPHY—(*Presented by the Societe de Geogra-*
phie, Paris.)
 —Bulletin de la Societe de Geographie. 4th
 Serie, Tomes XIV, XV and XVI. Paris,
 1857 and '58. 3 vols., 8vo., paper.
 MISSOURI—(*Presented by Edward Pelz, Esq.*)
 —Der Staat Missouri, etc. Von Friedrich
 Munch: mit 2 charten. New York, 1859.
 1 vol., 12mo., paper.

BOOKS ADDED BY PURCHASE.

- Brit. Imper. Calendar for 1832.
 Druses of Lebanon.
 Montgomery on Cotton.
 American Statistical Annual. (Fisher's)
 Taylor on Coal, etc.
 George's Fiscal Hist. of Texas.
 Thompson's Mexico.
 Bonnycastle's Newfoundland. (2 vols.)
 Latrobe's Mexico.
 Gregg's Com. of the Prairies. (2 vols.)
 Bryant's What I Saw in California.
 Puget's Hungary and Transylvania. (2 vols.)
 Vagabond Life in Mexico.
 Carpenter's Mexico.
 Campbell's Polit. Surv. of Britain. (4 vols.)
 Cotton and Corn in India.
 Smith's Wealth of Nations. (3 vols.)
 Low's Present State of England.
 Carey's Past, Present and Future.
 Commercial Crisis of 1837 and '38.
 Poole's Index to Periodical Literature.
 Gold and Silver Coins and Bullion.
 Hawk's Peruvian Antiquities.
 Rainey's Ocean Post.
 Am. Almanac, 1830-'55. (26 vols. in 13 vols.)
 " " 1856-'58. (3 vols.)
 U. S. Almanac. (3 vols.)
 Brit. Almanac, 1828-'56. (19 vols.)
 Williams' Annual Register. (10 vols.)
 Squier's and Davis' Anc. Monum. of Nineveh.
 Steinitz' Ship. 4to., with plates.
 Scrivenor's Iron Trade.
 Espy's Storms.
 Archeologia Americana. (1st vol.)
 Barrington's Physical Geography.
 Rhinde's Six Days of the Creation.
 Lord's Epoch of the Creation.
 Wilson's American Ornithology.

- Stat. of Woolen Manufactures.
 Edwards' Grain Tables.
 Bristed's United States.
 Darby's Botany of Southern States.
 Cheever's Island World.
 My Consulship. By Lester. (2 vols.)
 Olin's Greece, etc.
 Homes in Tasmania, and Diary of an En-
 nuyee. (2 vols.)
 Oliphant's Black Sea.
 Russo-Turkish Campaigns.
 Pulsky's White, Red and Black Sketches of
 America. (2 vols.)
 Christy's Cotton is King.
 Economica, 1810.
 Tour among the Planters. (3 vols.)
 Western Characters. (3 vols.)
 Capron's California.
 Wisconsin and Its Resources.
 Williams' Middle Kingdom. (2 vols.)
 Raumer's England in 1841. (2 vols.)
 Brace's Hungary in 1851.
 Hildreth's Banks, Banking, etc.
 Bonyng's Future Wealth of America.
 Gilbert's Commerce of the Ancients.
 Russell's Statistical Enquiry.
 Taylor's French Statistics.
 Tucker's Progress of the United States.
 Pope's Journal of Trade. (3 vols.)
 Martin's Twenty-One Years in the Boston
 Stock Market.
 Hunt's Library of Commerce. (Vol. 1st.)
 Stevenson's Hist. of Nav. and Commerce.
 Pitkin's Statistics.
 Ouseley's Statistics of the U. S.
 Bradford's Atlas.
 Sutherland's Baffin's Bay. (2 vols.)
 Montgomery's Guatemala.
 Squier's Antiquities of New York. 4to.
 History of the American Flag.
 Marquette's Mississippi.
 Doniphan's Mexico.
 Robertson's Nova Scotia, etc.
 Pictures of Nuremburg.
 Christine's Mediterranean. (3 vols.)
 Sullivan's Ceylon.
 Moffat's South America.
 Brett's Ind. Tribes of Guiana.
 Wilkinson's Ancient Egyptians. (2 vols.)
 Gobat's Abyssinia.
 Curzon's Levant.
 Seaman's Progress of Nations.
 Dearborn's Com. of Black Sea. (2 vols.)
 Boston. (Census, 1845.)
 Jenkin's Ohio Gazetteer.
 Rickart's Population and Capital.
 Hayward's N. Eng. Gazetteer.
 Cotton's Constantinople and Athens.

JOURNAL

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No. 6.

PROCEEDINGS.

NINTH MEETING, Thursday, May 5th, 1859.
Archibald Russell, Esq., 2d Vice President, in the chair.

The following gentlemen were elected resident members of the Society: John Sherwood, Charles A. Joy, Philip Lydig, Jr., Smith Clift, Edwin J. Brown, T. B. Stirling, C. M. Bovie, and Samuel Woodward.

Mr. Jay, Foreign Corresponding Secretary, read a letter from His Excellency, Christian S. M. Olrik, Royal Inspector of North Greenland, (dated Copenhagen, 15 Jan., 1859,) thanking the Society for the honor conferred by his election as a Corresponding Member, and enclosing two papers—one, "*A Meteorological Journal kept at Godhavn, N. G., from 1st January until the 20th September, 1858, by C. S. M. Olrik,*" and the other an "*Extract from the Meteorological Journal of Lady Franklin's Arctic Searching Yacht Fox, for Feb., March and April, 1858, (by Capt. McClintock, R. N.)*" referring to observations in the same latitudes as Godhavn, when drifting in the ice of Davis' Straits.

The Foreign Corresponding Secretary also read two letters, (dated 14th and 25th February, 1859,) from Gideon Nye, Esq., U. S. Consul at Macao, relative to recent events in China, and covering several printed papers on the same topics.

Mr. Jay, as chairman of the Agricultural Section, read the first part of a paper on the

"*Imported Live-Stock of the United States,*" prepared by Col. Lewis G. Morris, of Mount Fordham, Westchester Co., N. Y., chiefly referring to horses; and also a letter from the author, stating that the second part of the paper (referring to horned cattle, sheep and swine) would be presented at the next meeting.

The chairman of the Agricultural Section also read a paper on "*Vine-Culture in Missouri,*" by Fred. Munch, Esq.

The reading of the paper was followed by a conversation, in which Mr. Russell stated that Mr. Munch had published a volume on this and other interests of the West, and had recently returned to Germany for the purpose of inducing his countrymen to emigrate largely to the State of Missouri, and engage in the cultivation of the grape, and the manufacture of wine.

On motion, the thanks of the Society were voted to Messrs. Olrik, Nye, Morris and Munch, and their several communications were ordered to be deposited in the Archives of the Society.

The Recording Secretary read several letters on the current business of the Society, among which was one from the Spanish Government, notifying the Society of the grant made to its Library, of a copy of the recent census of Spain; and one from the University of Christiania, with a list of publications transmitted to the Society.

Adjourned.

DEPARTMENT OF GEOGRAPHY.

THE ISTHMUS OF TEHUANTEPEC.—ITS
INHABITANTS AND RESOURCES.*

GENTLEMEN OF THE GEOGRAPHICAL SOCIETY:

A glance at the map of the Western Hemisphere naturally suggests that the narrow strip of land which forms the connecting link between the two Americas, should furnish the greatest facilities for the opening of a communication from the Atlantic to the Pacific.

The project of such a communication has been the object of scientific investigation ever since the re-discovery and settlement of America, and attracted, as we all know, in a special manner, the attention of the navigators and geographers of Spain, from the period that the Spanish American colonies formed an integral portion of the Kingdom. The history of these attempts to open a route across the Isthmus of Tehuantepec is full of interest, not because as isolated items, they are new to the members of this learned society, but because they present a series of consecutive facts and circumstances which it is important to remember in an investigation like this.

In the conquest of the Mexican Empire, Hernando Cortez foresaw with that unerring accuracy of judgment which formed his chief characteristic, the realization of the broken dreams of Columbus, and the establishment of a commercial junction between the seas. It was under these circumstances that he devised the naval expedition of Christoval de Olid to the coast of Honduras, and the land reconnaissance under Sandoval, who crossed the Isthmus of Tehuantepec diagonally to Guatemala. We are all familiar with his memorable letter to the Emperor, in which he says, "Your Majesty may be assured that as I know how much you have at heart the discovery of this great secret of a strait, I shall postpone all interests and projects of my own, some of them of the

"highest moment, for the fulfilment of this great object."

Subsequent explorations demonstrated to him that the twin continents were inseparably united, and this long sought-for strait was only, after all, a chimera in the minds of those who knew nothing of the physical geography of the sea. Undeterred by this fact, he prosecuted his labors unceasingly. The expedition of Diego de Ordaz to the river Coatzacoalcas, and that of Luis Marin through its eastern tributaries to Chiapas, together with his own disastrous one through the province to the shores of the Caribbean Sea, had demonstrated the feasibility of an overland communication across the Isthmus of Tehuantepec. This knowledge, combined with the loving influences of Malinche, made Cortez turn his eyes away from the scenes of his glorious triumphs in the valley of Mexico, to locate the gift lands of his Emperor within sight of the province where that heroic woman was born; and then, as if to identify his name forever with the project, he chose for his title of nobility, the name of the principality through which the road should pass. From that hour till his death, Cortez cherished the hope of seeing it permanently established. Don Lucas Alaman, the ablest of modern Mexican historians, has left in the archives of the Mexican Congress, an elaborate account of the efforts which were made by the Conqueror to develop the agricultural resources of his estates in the valley of Oaxaca, by the introduction of slaves, implements, and cattle, while the writers of his day tell us how Cortez labored in "his own port of Tehuantepec" to establish the commercial intercourse which was essential to the maintenance of the Isthmian transit between the Gulf of Mexico and the Pacific. In this connection I may mention that the immense island of Tacamichapa, which is encircled by the diverging branches of the Coatzacoalcas, the Apolzonga and the Mistan was given by the Emperor Charles V to Malinche, in consideration of the invaluable services rendered by her to the conqueror. To this day in her native village, (once called Painalla, but now known

* An Address delivered before the "American Geographical and Statistical Society," on the 14th April, 1859, by John McLeod Murphy, Esq., C. E.

as Ialtipan,) the Indians lay claim to the tract, and say that Cortez located it for her on an island that its boundaries might never be disputed.

With the death of Cortez, the project sunk into comparative oblivion. Towards the close of the 17th century Dampier made an exploration of the Coatzacoalcos and constructed a chart of the bar, the soundings on which are the same as those of to-day.

In the year 1745, the idea of opening the Tehuantepec route was again revived by some enlightened men in Oaxaca, who presented a memorial to the Viceroy of Mexico, setting forth the immense advantages that would arise to the Kingdom by making the Coatzacoalcos a port of entry. This document which contained a topographical description of the Isthmus, and a minute hydrographical discussion of the various ports on the Pacific, displayed an intelligence and foresight scarcely to be expected in days so dark and overshadowing to intellectual culture as those. The merchants of Vera Cruz no sooner heard of this memorial, than they adopted the most extraordinary means to prevent its reaching Madrid. At Cadiz, the Philippine Company exerted a powerful influence at Court, against the Isthmus route; and in a lengthened appeal to the Crown they set forth the commercial calamities that threatened to ensue. In this tirade they were joined by the traders at Acapulco, and the result was an order from the Court, denouncing the projectors as "Audacious innovators of the established regulations and commerce of the Kingdom," and prohibiting them ever again reviving the subject under pain of the royal displeasure. But the most interesting document which has been handed down to us, is from the pen of Don Augustin Cramer, who was an engineer by profession, and who made, by order of the Viceroy Don Antonio Maria Bucauli, an examination of the entire route. This was performed in 1774, and embraced a plan for a small canal by confining the waters of the rivers which traverse the Isthmus in an east and west direction, and then opening a dyke through the

table lands to the Chicapa. The topographical descriptions given by Cramer are of admirable exactness, and his work shows an intimate knowledge of engineering. These results, although communicated to the Spanish government, attracted no notice whatever. Later and when it might be supposed that such unnatural and impolitic restrictions would be beneath the dignity of Spain, the Viceroys Revillagigedo and Iturregaray urged the plan of a ship canal to unite the waters of the Coatzacoalcos on the north, with those of the Chicapa on the south, but the application was treated with contempt, and both incurred the rebukes of the haughty cabinet at Madrid.

The next writer upon this subject was Baron Humboldt, but as he never visited the Isthmus his identity with the project is rather that of a learned and powerful advocate, than an actual explorer of the region through which it was designed to pass. On the 30th of April, 1814, a decree of the Spanish Cortes was issued authorizing the opening of this canal. But the subsequent declaration of Mexican Independence, and the engrossing political distractions which followed, left that government wholly unable to turn its attention to the realization of so gigantic a scheme.

In 1820 William Davis Robinson, an American citizen, published a valuable memoir of the Mexican Revolution, in which he bore a conspicuous part as a soldier under General Mina. This work contains an interesting account of the various inter-oceanic routes; and as the writer spent a considerable time on the Isthmus of Tehuantepec, his views drawn as they were from actual observation, are extremely accurate, and embrace a valuable computation of the distances between Tehuantepec and the route to China.

We thus see in the comparatively early days of this project, the association of an American name with its proposed development.

In 1824 a commission was appointed jointly by the State of Vera Cruz and the Federal Government, to survey the Isthmus. This consisted of Don Tadeo de Ortiz and Colonel Don

Juan de Orbegozo. The former was directed to examine the country with reference to a system of colonization, and the latter to make an engineering report on the feasibility of a carriage road. It will be time enough, however, to speak of these results hereafter.

In 1830 an extensive scheme for colonizing the Isthmus, ostensibly in view of an immediate opening of the route, but in reality to convey into exile a body of men who had participated in the revolution, was projected in France, under the auspices of Laisne de Villivegne, who fitted out an expedition consisting of five small vessels, named the *Petit Eugene*, the *Glaneuse*, the *America*, the *Diana*, and the *Hercules*. These left Havre within a few days of each other, in the latter part of November of that year, and reached the mouth of the Coatzacoalcos after a boisterous passage of 69 days. On attempting to cross the bar, three of the vessels were wrecked; and although no lives were lost, it is impossible to describe the sufferings which the poor emigrants were compelled to endure. On reaching Minatitlan, the custom house officials seized the inadequate supplies saved from the wrecks for non-payment of duties; and the colonists, who were principally mechanics, musicians, and professional men, found, to their dismay, that the lands intended for their settlement were only the low, inundated marshes along the shores of the Coatzacoalcos. The magnificent plantation of Mons. Giordan, the consignee and agent, (of which so much had been said before leaving France,) consisted of a small wooden house and a garden of about ten yards square, in which were planted a few pine apples. One of the emigrants, Matthieu de Fossey, thus fills up the details of this melancholy picture: "When the calamities of the settlers reached the culminating point, they scattered in every direction over the republic. Those who had settled on the borders of the Sarabia went to Guichicore, Tehuantepec and Oaxaca, where they applied themselves to different occupations; others journeyed overland to Vera Cruz, and re-embarked for France; others again remained at

Minatitlan, which soon became converted into an hospital, destitute alike of medicines and nurses. In all the houses were to be seen the dying abandoned, and the convalescent unable to escape. In the broad, sweeping strokes of his scythe, the blind harvester death, left women and orphans without protectors; some mothers, in their maternal tenderness, found sufficient strength to contend against these distressing evils; many of the children were taken care of by the Indians and the rich creoles; others took situations as servants; and a number of young women, carried away by despair, gave themselves up to shameful lives of prostitution. Unfortunate and unhappy as were the consequences of this emigration scheme, it is plain to be seen that it was undertaken without any regard to the well-being of the colonists, or what is perhaps more deplorable, without the slightest knowledge, on their part, of the country, its laws, or its inhabitants. It suffices to say that scarcely a vestige now remains of this colony, which consisted of 300 souls.

With the exception of what was done by Hernando Cortez, in the construction of a military road from Tehuantepec to the navigable waters of the Coatzacoalcos, and thence by sea to Vera Cruz and the Havana, nothing of a practical character was ever attempted. This road continued to be used for upwards of a hundred years, but, owing to the hydrographical changes which occurred at the entrance of the Lagunas, (the Pacific terminus of the route,) the port was superseded, and a new route was opened from the City of Mexico to Acapulco. Gradually the spirit of monopoly which pervaded every commercial institution in Spain, limited the intercourse of trade to a single port in each sea, viz.: Acapulco on the Pacific, and Vera Cruz on the Gulf of Mexico, and thus the passage of Tehuantepec passed into disuse. However, in 1798 it was re-opened, to convey the indigo from Guatemala to Vera Cruz. But with this exception, as we have seen, no *bona fide* steps were taken by the Mexican people, either as colonists of Spain or as an indepen-

dent nation for a period of more than 300 years.

In noticing these historical memoranda of the various attempts to open a transit route across the Isthmus of Tehuantepec, we are forcibly struck with the high character of the men who explored it, and urged its construction. It is evident, nevertheless, that the failure to accomplish anything arose from no want of knowledge of the practicability of the project, but that it was stifled amid the jealousies which have forever cursed the commercial enterprise of Spain.

Finally, in 1842, a grant was made by Santa Anna to Don Jose de Garay, an enterprising Mexican citizen, through whom the franchise passed, after various modifications and diplomatic vicissitudes, into the hands of American capitalists. To the engineers under the auspices of Mr. Garay, we owe much of our present knowledge of the local geography of the Isthmus. The chief object of this commission was to ascertain the practicability of a ship canal, but, unfortunately for the undertaking, the enormity of the capital required for its construction kept the project in abeyance, until the science of engineering pronounced against the folly of *all* inter-oceanic communications by water.

On the death of Don Jose de Garay, the commercial world was deprived of one of its most valuable and comprehensive intellects, and in him humanity lost a benefactor. It is sad to think that it was not accorded to him to witness here the consummation of his darling project; but perhaps it was because he was called to observe, from a higher point of view, the humanizing influences which he dreamed would come to pass.

It is not a little singular, that after a lapse of three centuries, a corps of American engineers should be able to trace on the Isthmus, as the most feasible line for a railway between the Atlantic and Pacific Oceans, the very road which the conqueror of Mexico caused to be made. Indeed, I may say that, from the plains of Sarabia to the city of Tehuantepec, a dis-

tance of seventy-seven miles, the alignment is almost identical.

But let us glance now at the geographical position of the Isthmus, which lies within the territorial limits of the eastern sections of the States of Oaxaca and Vera Cruz. It is the narrowest portion of the Mexican Republic, that is washed by the two great seas, and is comprehended between the parallels of $16^{\circ} 6'$ and $18^{\circ} 10'$ north latitude. Although the coast line on the Mexican Gulf tends almost due east and west for a considerable distance, the boundaries of the Isthmus proper are marked on the east by the entrance to the Laguna of Santa Anna, and on the west by the majestic peaks of Pelon and San Martin. On the Pacific side, which is the portion within the intendency of Oaxaca, the Department of Tehuantepec stretches eastwardly to the limits of Tlacolula. These somewhat irregular boundaries comprise an area of very nearly 10,350 square miles, being somewhat grater in extent than the State of Vermont.

The geographical position of the Isthmus of Tehuantepec can be perceived at a glance. But what shall we say of the tremendous revolution that is destined to take place in the commerce between Europe and the west, when this connection between the two oceans is permanently established?

Doubling the stormy cape will then be unknown, and voyages around the world will be changed to "trips" across. The American continent will then become the entrepot for the commerce of the universe, and the United States the "Mistress of the Seas."

Enough has been said to demonstrate to the satisfaction of every intelligent mind, the immense advantages which arise from the geographical position of the Tehuantepec route. In a military point of view it is of all the routes proposed, the true American one. It is the route which is entirely commanded by our possessions on the Gulf of Mexico, and not domineered over by any British possession whatever. We are therefore better prepared to defend, occupy, and keep the Isthmus of Tehuantepec, than

any other position on this side of our continent south of New Orleans.

As a project it is the only one which holds out a hope for our fallen and prostrate sister Republic. The mining interests of Mexico have long since perished, and her commerce is dead beyond the hope of human resurrection.

The true policy of our government upon this important subject is too plain to need comment from me. The Isthmus of Tehuantepec is the great artery through which the life blood must flow to the palpitating heart of the Mexican nation.

Through the efforts of the Louisiana Tehuantepec Company, the route was formally opened on the first of November last, and since then the mails have been successfully carried between New Orleans and San Francisco in fifteen days.

The transit is made in light draft steamers for ninety miles to the navigable head-waters of the Coatzacoalcos, where it connects with the land conveyances and passes through a country of hill and dale and plain unequalled in the world for salubrity of climate and richness of scenery. This distance of 116 miles over a well constructed carriage road, brings the voyager to the shores of the broad Pacific. At Ventosa the present terminus, he is conveyed on board of the mail steamer, and in a week he is landed in San Francisco.

As respects the topography of the Isthmus, I trust that I may be pardoned the liberty of extracting from the published account of the survey of Major Barnard the topographical description which I had the honor to contribute to that work more than eight years ago.

In considering the Isthmus with reference to its general topographical features, it may properly be said to comprise three main divisions, more or less distinct in topography, climate, inhabitants and productions; the first, embracing that portion extending from the Gulf to the base of the Cordillera, and which may be called the Atlantic plains; the second comprising the more elevated or mountainous districts in the central parts; and the third, including the

level country bordering the ocean on the south and known as the Pacific plains.

The first division comprises a belt of country of some forty or fifty miles in breadth, lying contiguous to the Gulf coast, and made up of extensive alluvial basins of exceeding richness and fertility, through which the drainage of the northern slope of the Cordillera discharges itself into the Gulf.

The principal of these hydrographic basins is that of the Coatzacoalcos, which occupies the central portion of this division, and has a general direction of N. N. E. by S. S. W.

Conspicuous to the west of the Coatzacoalcos are the peaks of San Martin and Pelon, which constitute the most striking topographical features of this division of the Isthmus. The former of these peaks was so called because San Martino, a soldier of the expedition, first described it from the deck of Cortez's vessel, and the latter obtained the name of Pelon or the "Bald Mountain" from the Indian fishermen on the coast. These mountains terminate a long chain of hills extending to the west, known as the Tuxtla Range, between which and the Jaltepec River on south, the only highlands are the Encantada mountain, five miles to the west of the Coatzacoalcos, and thirty miles from the Gulf; Mount Tecuanapa, thirty seven miles eastward of this, surrounded by extensive plains; and the cerros of San Vincent and Acalapa which lie west of the Tonalá.

With the few exceptions here referred to, the entire country embraced in the northern division, presents the appearance of a broad plain entirely covered with dense forests.

The second or middle division may be said to extend from the Jaltepec River on the north to within twenty-five miles of the Pacific, comprising a strip of country through the central portions of the Isthmus, of some forty miles in breadth on the west, and gradually widening out towards the east, to sixty or seventy miles. This division presents a great diversity of feature. The immense chain of the Cordillera, which, under different denominations, extends almost without interruption, the entire length

of the two Americas, traverses the country from east to west; but instead of those lofty volcanic peaks which constitute so striking a feature of extensive portions of this gigantic chain of mountains, there is a sudden depression of the range in its passage across the Isthmus, the continuity of the chain being nearly broken at a point directly in the line of shortest communication between the two oceans.

The elevated spurs and ridges which traverse the country generally in an east and west direction, offer the principal obstacles to the constructions of a railroad across this portion of the Isthmus.

Further to the south are the hills of Xochiapa, which originally seemed to have formed a connected chain, joining the mountain range to the east and west, but have been cut through or divided by the Malatengo, Almoloya, and Chichihua Rivers; thus opening natural passages through a range of hills, which otherwise would seem to have offered an almost insuperable obstacle.

Between this range and the summit pass, the country is made up of elevated rolling plains, which are divided by low ranges of hills into three divisions, known respectively as the plains of Xochiapa, Chivela, and Tarifa. They gradually become more elevated as we approach the summit pass, and also present a more uniform surface. They are bounded on the south by cerros which terminate in rugged limestone peaks, at an elevation of from 1500 to 2000 feet above the Pacific; and form the only connecting links between the high mountain chain of Oaxaca, and the cordillera of Guatemala.

By a narrow opening or gap in these mountains, we descend suddenly from the elevated table-lands to the Pacific plains, which form the third or southern division.

These plains average about twenty miles in breadth, from the base of the mountains to the Pacific coast, and descend at an inclination varying from ten to fifteen feet in the mile, thus forming, as it were, an immense inclined plane, with its side next the mountains, about two hundred and fifty feet above the Pacific. Under

these circumstances they present a gentle slope towards the sea.

The plains were traversed by eight rivers which discharge the drainage of the southern slope into the Pacific.

The most important of the streams are the Ostula and Chicapa on the east, and the Tehuantepec on the west. The first two named rivers have their source in the highest parts of the Sierra to the east of San Miguel Chimalapa. It is said of them that they always rise and fall simultaneously, the slightest change in one stream being accompanied by a corresponding variation in the other, a fact which has originated the belief that they have a common source in a lake supposed to be on the summit of the mountains to the east; though the true reason is no doubt to be found in the fact that they both proceed from the highest points of the Sierra, and through the upper part of their course are in close proximity to each other.

The lagoons which receive most of the drainage of the southern slope extend a distance of nearly forty miles along the coast, and comprise an area of more than two hundred square miles; they are divided by a narrow peninsula of land into two principal divisions, known as the upper and lower lagoons. Though of considerable extent, they are generally shallow, and no doubt annually becoming more so from the sediment brought down by the numerous rivers which discharge into them.

The Bay of Ventosa is formed by an indentation in the coast, and the projection of the Cerro Moro on the west. The Tehuantepec River discharges itself near this point. The bay is partially sheltered from the north winds by low ranges of hills from seven to nine miles distant. A short distance to the westward is a deep indentation of the coast known as Salina Cruz. This, no doubt, will become the terminus of the Tehuantepec route, on the Pacific, not only by reason of its being better sheltered, but because the easterly currents are deflected by the Moro Point which forms the only claim of Ventosa to a harbor. The anchorage is good,

and the shores are bold and deep. Of the streams watering the northern slope of the Isthmus, the most important by far is the Coatzacoalcos, which serves not only for the drainage of a large extent of country, but also furnishes the natural channel through which the projected communication between the two oceans is in part effected. It has for its tributaries on the east the Chimalapella, Pirial, Chalchypa, Churriagas, Coachapa, Uspanapa, and San Antonio Rivers, and on the west there falls into the Coatzacoalcos, the Milago, Malatengo, Almoloya, Sarabia, Jumnapa and Jaltepec, together with innumerable streams of lesser import.

The Jaltepec River has its source in the Sierra of the Mijes, situated in the district of Villa Alta, and is navigable for light draft steamers all the year round, to a spot forty-five miles from its mouth. This river is nearly as large as the Coatzacoalcos above the confluence of the two streams, and is the most important tributary on the west. The general course of the Coatzacoalcos, from the confluence of the Malatengo to that of the Jumnapa, is from south to north; it then runs north-west until it meets the Jaltepec, and thence to the bar its general course is north-east.

At the Horqueta, as has been said, the river branches—the western arm being called the Brazo Mistan, and the eastern, the Brazo Apotzongo; these branches unite after having formed the circuit of the island of Tacamichapa; seven miles below this point, the Coatzacoalcos receives the waters of the Coachapa River on the east. The source of the stream is unknown, but it has been ascended in canoes for twelve days—the time usually occupied in going from the bar of the Coatzacoalcos to the pass of Sarabia. Schooners have also sailed up it for a distance of several miles. The cross ties used on the railroad at Vera Cruz were manufactured from timber obtained from the banks of this stream.

Four miles below the debouche of the Coachapa, but on the opposite shore, is the village of Minatitlan, and three miles below this, the

river Uspanapa joins the Coatzacoalcos by its right bank.

The Uspanapa is the most considerable of all the numerous tributaries of the Coatzacoalcos, and is, in some respects, even superior to the latter stream for purposes of navigation—carrying a sufficient depth of water to float large vessels to a greater distance from the Gulf, and also being less tortuous. In 1851 I explored it for a distance of 45 miles, but its source has never been reached.

Below the Uspanapa, near a spot named Paso-Nuevo, through which runs the high road leading to Tobasco, the river San Antonio joins the Coatzacoalcos, proceeding from some marshes nineteen miles above its mouth; and one mile lower down, on the opposite bank, it receives the waters of the Tacoteno River.

The banks of the river below Minatitlan are very low, and frequently flooded. The mouth of the Coatzacoalcos, the geographical position of which is $18^{\circ} 8' 20''$ N. lat., and $94^{\circ} 32' 50''$ long. west from Greenwich, is 115 miles west from the river Grijalva or Tobasco, and about 110 miles from Vera Cruz. Its width is about 1,500 feet, and its depth varies in different places. A transversal section of the river, over the bar, shows it to be slightly swelled in the middle, and hollowed out towards the two banks of the river; the hollow and the right forming the eastern, and the other the western pass.

As soon as the bar is crossed, and the ascent of the river commenced, it widens and deepens, and at seven miles from the Gulf, the lead shows a depth of 40 feet, which is preserved for some distance. The least depth in the channel below Minatitlan is twelve feet, and this may be carried nearly to the island of Tacamichapa. The superior advantages offered by this stream as a safe and convenient harbor for ships, early attracted the attention of the Spanish conquerors. Cortez, in his official dispatches to the Emperor Charles V, speaks of the importance of this river, as furnishing the best harbor to be found on the Gulf coast of Mexico. In giving the results of a survey of

the river, made by his order, he says: "They found two fathoms and a half of water at its entrance, in the shallowest part; and ascending twelve leagues, the least they found was five or six fathoms."

These soundings were made in the year 1520, and give about the same depth over the bar at the mouth of the river which we now find.

Thus in brief, we have a topographical view of the country through which, in 1851, Major Barnard, one of the most distinguished members of the corps of the U. S. Engineers, traced the line of the Tehuantepec Railway; and step by step we have been enabled to follow the project, until its final surrender into the hands of our own citizens; among whom none deserves a higher meed of praise for his perseverance and patriotism than Mr. P. A. Hargous, of this city.

But let us look again at the Isthmus, and while we note its productions, make the acquaintance of the people who inhabit its dense forests, its rolling table lands, and its cultivated plains.

I have already said that this portion of the Mexican Republic may be divided into three distinct parts, and that these parts differ from each other in all the essential respects of topography, climate, inhabitants, and productions.

The Atlantic plains present a broad belt of rich, alluvial country, covered with a reeking mass of vegetation. The lands are incomparably rich, the climate is close and humid, and the population sparsely scattered amid the densely wooded tracts of country. This is the real region of the pine-apple and the palm. The hundred varieties of the latter tower gracefully above plants of the most impenetrable foliage, whose overhanging chumps of verdure sweep the current at every sinuosity. But if the family of palmæ be large, the diversity of its useful purposes is not less so. One kind yields substitutes for bread and yeast; another, sugar and wine; a third, oil and vinegar; a fourth, milk and wax; a fifth, resin and fruit;

a sixth, medicines and utensils; a seventh, weapons and cordage; an eighth, paper and clothing; and a ninth, habitations and furniture. Here also grows spontaneously the *bromelia pita*, which flourishes alike indifferent to soil, climate and season. From it is fabricated thread and cordage mats, bagging and clothing, and the hammocks in which the natives are born, repose and die. The fibres of the *pita* are sometimes employed in the manufacture of paper; its juice is used as a caustic for wounds, and its thorns serve the poor Indians for needles and pins. Throughout all the forests which skirt the tributary streams, the *india rubber* tree is found in astonishing numbers; and in equal abundance grows also the vanilla, the sarsaparilla, and the liquorice root. On the plains east of the river Coatzacoalcos, rice, cotton, sugar cane, and allspice are raised, wherever cultivated, in considerable quantities. Among the staple products of this region is the coffee tree and the three broma cacas. Everywhere on the *milpas* two crops of maize are annually obtained, and it is no uncommon thing to find the reaper and the sower engaged in the same field. But the most lucrative source of trade already opened on the northern division of the Isthmus, is the cutting and shipment of mahogany. This valuable wood owes its introduction to the mechanic arts to Cortez and his companions, who employed it in the construction of the ships which they built for prosecuting their voyages of discovery. It is a curious fact, that while England is the greatest consumer of mahogany to day, it was not used there until the year 1724, when the Duchess of Buckingham had a bureau made out of some random planks which were sent as a present to her family physician. It is needless to say that her ladyship regarded the article as a luxury, and the cabinet maker realized a fortune. During the last year, the shipments of mahogany from Minatitlan averaged between 40,000 and 50,000 tons. I may add that the quality of the wood is excellent, and the quantity inexhaustible.

Fruits of every description are abundant, and

such is the fecundity of their production, that there are actually *forests* of fruit trees on many parts of the Atlantic plains. In the midst of this paradise of vegetable productions, where the veteran Bernal Diaz settled himself more than 300 years ago, we find now only a squalid remnant of the tribes of Aztecs and Agualulcos, numbering about 25,000 souls. The thrilling and dramatic history of this once mighty people naturally fills the imagination with conceptions of "fair women and brave men," but long slavery and oppression has crushed their hopes, and broken their hearts. An atmosphere of apathy pervades everything, and the whole race seem to have yielded themselves up to the stern decrees of fate. The men are inveterate drunkards, and their passion for drink is carried to the greatest excess. But there is no frenzy in their intoxication; they become dogged, sullen, silent, and beastly drunk. The children are grave and thoughtful. The women seldom, if ever, smile, and there is an air of sadness about them which is painfully oppressive. They cherish no longer the traditions of their people, save one only, and that is of Malinche. This noble woman, who was the first of her nation to receive the sacrament of baptism and the Christian name of *Marina*, was the daughter of the Cacique of Coatzacoalcos. But in her youth her father died, and her mother married again. The result of this union was an offspring upon whom the inhuman mother bestowed all of her affections, and as the newborn infant advanced in years, poor Malinche became an object of jealousy and hate. Fearing to imbrue their hands in the blood of the innocent child, her parents, who shed hypocritical tears over a corpse of a little slave, sold her to some traders who were going to Tobasco, and pretended that Malinche was dead.

Long years afterwards, and when Malinche had grown to womanhood, the expedition of Cortez entered the river Grijalva, and there, because of her peerless beauty, she was presented as a gift to the conqueror of Mexico. From that hour she became his counsellor, his interpretress, and to her *misfortune*, his mistress.

Every page in the history of the conquest teems with the praises of this extraordinary woman, and her name is as imperishable as the memory of the events in which she bore so conspicuous a part.

Later, when the banners of Castile floated from every battlement in the conquered empire, she, who had told to Cortez the pitiful tale of her banishment, was restored by him to the home of her unhappy childhood. The Abbe Clavigero, one of the ablest writers on Mexico, thus briefly describes the visit: "She saw her mother and her brother, who presented themselves before her, bathed in tears, and covered with confusion, but she received and caressed them with great affection."

A quaint old Spanish writer on the events of the conquest, pays Malinche this invidious compliment. He says, "she was the first woman who ever accompanied an army without being a prejudice to it."

It is impossible to visit any habitable portion of the Isthmus—even the remote pueblas on the confines of Chiapas, or the scattered ranchos on the slopes of the Western Sierra—without hearing, from the untutored lips of the poorest Indians, the praises of Malinche. Go where you will, her memory is as fragrant as the lilies which everywhere bathe their drooping heads in the shining rivers; and many an Indian child is wooed to slumber by the melancholy song which its mother sings of the captivity and unrequited love of the Indian Princess.

In her native village, her memory is cherished with an affection which almost passes belief; on the return of her anniversary, a solemn mass is said for the repose of her soul. This is participated in by the inhabitants of all the neighboring towns, who flock in thousands, with floral offerings, to scatter over the grassy mound beneath which her remains are said to repose.

For weeks in advance, the young maidens nurse with tender care the choicest flowers that bloom in the vales, and as they twine their garlands, they chant the traditionary prayer, that she will some day return to the

ancient province of Coatzacoalcas, to sweep from the homes the blight she had involuntarily aided to bring.

I may here pause to observe, that the name of this province, which is so difficult of pronunciation, derives its origin from one of the Mexican deities, called *quatza-qualt*, whose insignia was a great feathered serpent.

Forgetful as the world ever is of the labors of the Catholic missionary, the question may be asked, how did he succeed? The answer for Mexico is, that the sword and sacrament went hand in hand, and that the hour which witnessed the subjugation of the Mexican Empire, saw also the conversion of its mysterious people to the dogmas of the Christian church.

The same miraculous circumstances which seemed to envelope the person of Cortez, and to crown all of his acts with success, surrounded also the threadbare friars who followed meekly in his glittering train. But they were learned and gifted men. The traditions of the Indians were ever utilized as a means for the introduction of the truths of Christianity. Even the *plants* and *fruits* were brought into requisition to prove that the Saviour died for the elevation of mankind.

It is recorded of a veteran priest that, failing once to convince a multitude who had gathered to witness the immolation of a human victim, he seized the Obsidian knife with which the sacrifice was to be made, and cutting a banana in two, showed them the wonderful effigy of the crucified Redeemer. The thorny *mimosa*, which grows along the isothermal line that passes through the Isthmus, and extends across the arid deserts of Barca to the Holy Land, is identical with the plant from which was woven, more than 1800 years ago, that agonizing garland, the *crown of thorns*.

It is impossible to look upon this emblem of torture, which mocks the pretensions of all human kings, without realizing, in thoughts too pathetic for utterance, how bitterly He suffered, who alone received "the Divine right" to wear a *crown*.

In every hut on the barren hill sides, where

the mimosa grows, this sad memento of the crucifixion is kept to remind the simple inmates of that most awful event in the history of the Christian religion.

The exquisite flower of *espíritu santo*, which is so called because it contains between the folds of its snow-white leaves the remarkable image of a *dove*, was the means by which the Indians on the Pacific plains were taught the soothing doctrine of the Holy Spirit.

In the explanations which have been given to the Mexican paintings in Lord Kingsborough's collection, we are astonished at the approximate coincidence in the character and attributes of the Zapotecan Deity, *quatza-qualt*, and those of our Saviour. It was by tracing this similitude in that painting, that the Dominican fathers made the first substantial inroad into the fearful rites of these idolatrous people.

The explanation of this remarkable painting is that the God of the Milky Way sent a messenger to a virgin in Tulan, telling her that it was the will of the gods that she should conceive a son; which she did, without having known man. This offspring was Quatza-qualt, whose name signifies "our dearest son." He was the first who invoked the gods, sacrificed to them, made penance in order to appease them and to expiate the sins of mankind. He sacrificed even himself, drawing his own blood with a thorn, and after death rose again to sit in glory opposite to *Cantico*, in honor of his penance and abstinence. He was the only god with a human body, and it was *he* who created the world and the first man.

This wonderful interpretation of the attributes of one of the greatest Mexican deities, afforded a ready means to convert the nation and to substitute the true God for the false one. But, alas! this is the sole refreshing circumstance in the torn and faded history of their conquest and subjugation.

The Indian language on the Atlantic plains is a mixture of Maya and Aztec, replete with corrupt and broken sentences of Spanish, but in a little while this wretched dialect which is spoken by them, will die out, and leave no

trace of the distinctive origin of the two tribes. In their persons the Indians are somewhat below the medium stature, but squarely built and of great muscular strength. The women on the other hand are more delicate in frame, and in some instances beautiful and well-proportioned—a beauty which is enhanced by their unpurchasable virtue and their devotion to home. In matters of dress they wear the plainest and coarsest materials, confining their decorations alone to the head. Sometimes the hair is bound up in shining masses, with gay-colored ribbons and interspersed with wild flowers, which grow everywhere in great profusion. Sometimes, on the occasion of a *fiesta*, the cucullo—a beetle which emits a flashing phosphorescent light—is introduced among the raven clusters of hair, as an auxiliary to the Indian maiden's charms.

In the country to the east of the Coatzacoalcos, there are numerous evidences of the history of a once vast and powerful people. These consist chiefly in the number of mounds, artificial wells, copper hatchets, obsidian knives, razors, and other implements which are scattered over the country. In some reconnaissances which I made of the lands bordering the Tancochapa River in 1851, I found many of these relics; and, indeed, other unmistakeable traces of a comparatively advanced state of civilization. Near the town of Ishuatlan in the direction of the Gulf of Mexico, there is said to be a huge stone idol and the ruins of an ancient temple. It is not improbable that this may be the spot where Bernal Diaz "sowed his eight orange seeds," the first which were brought to Mexico. The old veteran, after telling us that he planted the seeds at the foot of the temple in gratitude for a night's sleep without molestation from the mosquitoes, says: "I have merely related this in order to acquaint my reader that these were the first orange seeds that were planted in New Spain." So after all, the delicious fruit is not indigenous to Mexico, according to Bernal Diaz.

A remarkable ethnological fact is the existence of a race of dumb people, of which there

are numerous families near Jaltipan. However strange this may appear, it is nevertheless certain, and the *Ranchos de los nudos* (dumb settlement) established a few years since near the lower part of the Island of Tacamichapa, owes its designation to the fact that the individuals are all dumb who inhabit the three or four houses which form this settlement. They intermarry, and thus perhaps this silent race is perpetuated. I may here mention that when a child is born among them with the gift of speech, it is invariably thrust aside.

Of the towns that existed anterior to the conquest, there are several west of the Coatzacoalcos, all of which retain their Indian names, and are readily recognized on the maps published about the time of the conquest. The most important of these is Acaquaur, once the court and residence of the father of Malinche, who was one of the most powerful caciques of the great Aztec Empire. It is now the capital of the Department, and a place of considerable importance. Near the junction of the River San Antonio, but scarcely discernable amid the densely luxuriant foliage, are the ruins of the settlement of *Espiritu Santo*, founded by the Conquistadores in 1522. This was the home of the honest old soldier Bernal Diaz, who lived for upwards of thirty years in the province. For a long period it continued to be a flourishing town, but was sacked and burned by the buccaneers in 1683. It is said that the pirates even stole the bell from the chapel and carried it to Tortugas, where they added it to the chimes of the church in which they offered up their accustomed prayers after a successful marauding expedition.

At the present time Mina-titlan, which is the head of ship navigation on the Coatzacoalcos, twenty miles from the sea, is a place of considerable importance. Under the developing influences of the newly established transit route, it has risen from the degradation of a Mexican-Indian village to the dignity of a bustling American town. The climate of this section, from the alluvial character of the soil and the dense vegetation, is less healthy than that of

the other. During the rainy season, which begins in June and ends in November, persons not acclimated are subject to attack of *Calentura*—a mild form of intermittent fever, due to miasmatic poison. It is a well-noticed fact in tropical climates at least, that the miasma invariably lingers in the foliage of plants. Hence it is that the natives adopt the custom of fixing their camping places in the open air beyond the shadows of the trees. It would be a task indeed to attempt a description of the matchless scenery between the navigable extremities of the Coatzacoalcos. For a distance of more than ninety miles, the river threads its silvery course through evergreen palisades of waving palms. Thousands of creeping plants decked with blossoms, bend downward from the overarching growth above forming the most fantastic bowers. In such fairy scenes as these, birds of exquisite plumage sweep the air in their flight, and make the dense forest ring with the melody of their songs.

On the River Jaltepec, one of the exploring parties under my command penetrated an extensive cave on the southern bank of that river about thirty miles from its confluence with the Coatzacoalcos. Lieut. Ring, who conducted the expedition, in his official letter to me describes the head of a lion at the entrance of the cave, carved in bas-relief in the solid rock with such surpassing beauty that it startled him. Penetrating further, the stalactites pendant from the vaulted ceiling of this enchanting cavern, glistened in the light of their torches like branches of burnished silver. On every side were magic fountains that seemed to throw up alternate handfuls of opals and pearls. From this cave many interesting relics were obtained, among which I find an artistically modeled eagle's beak,* which seemed to have served as the handle of some vessel. This will show in a measure how well the people of this *unconquered* region conducted their approaches to the impregnable fortress of perfect civilization.

* This was exhibited to the audience, and is now in the possession of Judge Daly.

Passing to the central division, as we rise above the alluvial bottoms of the Coatzacoalcos, the vegetation which is of a soft and succulent character, changes to that of a fine and cellular tissue, as the mahogany, cedar, zapote, and acacia.

The road out from Suchil (the head of shoal water navigation,) leads through a dense forest of these trees for twenty-five miles, crossing the Tortugano and Jumnapa Rivers, beyond which begins the rolling prairies of Sarabia, and the clear open country. High up on an abrupt spur of the Cordillera towards the west, is the town of *San Juan Guichicori*, which is said to have been settled a long time anterior to the conquest. There is a curious tradition of these Indians which runs thus: In one of the fearful struggles for dominion in Peru, a small nation called *Mijes* who inhabited the valleys of the Andes, fled from the oppressive tasks and cruelties of their conquerors to the north. Following for many weary months the bases of the mountains which skirt the sinuous coast of the Pacific, they passed peacefully through the kingdom of the Tapotecos, and finally reached the plains of Sarabia. Believing themselves secure from further persecutions, they determined to subject the land to the test of fire.

For this purpose the sacred ember was buried at the setting of the sun, and throughout the night they held their gloomy incantations. On the following day the ember was found to be extinguished, and with sorrowing hearts they obeyed the mandate of their oracle to push their journey further. Leaving the plains, they defiled westward through the mountain gorges and climbed the rugged steepes of the Cordillera, where, exhausted from fatigue and the burning heat of their wrathful deity, they halted under the spreading shades of an enormous *cuapinol* tree. The beauty of the scenery, and the high hills which concealed them from view, determined the chiefs to resort again to the sacred fire. Another night of fearful suspense closed upon the *Mijes*, but when the sun rose resplendent in the east, its dazzling light fell upon the

still burning ember, which sent up its curling incense to the god of day, and the joyous songs of the wandering nation announced that the pilgrimage had ceased. It was upon this spot that they determined to found a city, which they called in the language of the Mijes, Huitzicou, pronounced by the Spaniards Giutzicovi, signifying *pueblo nuevo*, or new settlement.

Whether this tradition be true or false, there is one circumstance which seems to confirm it. The Guichicovi Indians have among them the Peruvian Alpaca, (*Auchenia*), and they are the only cultivators of the potato on the Isthmus. If, then, the vegetables, like the languages and physiognomy of nations, indicate either an identity of race or ancient communication between men who live under different climates, they may become the most imperishable historical monuments. In this view perhaps the tradition is true. One thing is certain—the Mijes differ in essential respects from all the other tribes on the Isthmus.

The lands in the central division, though less fertile (except on the river margins,) than those which lie nearer the Gulf, present every variety of soil and production, and the climate without question is the healthiest on the Isthmus, because this portion of the route is more elevated and better drained. The scenery all through here is surpassingly beautiful, and the vista from the summit of the Malatengo Hills, with its magic effects of light and shade, might challenge the noblest efforts of a Claude Lorraine. From these gigantic hillocks we see spread out before us like a map, the *estates* of *Marquesanas*—the gift lands of Charles V to the Conqueror of Mexico—stretching away to the south, even beyond the sharp angular peaks of the dividing ridge. All through this vast estate, which embraces an area of somewhat less than 200,000 acres, there are ruins of indigo vats, lime-kilns, corrals, and other improvements. But it has long since passed away from the descendants of Cortez, among whom, in my curious researches I find the family of that charming little songstress, *Piccolomini*. In 1835 the Duke of Monteleone, becoming no

doubt tired of the shameful mismanagement of the estate, ordered it to be sold, and from that time it passed into the hands of Don Esteban Maqueo and Don Joaquin de Guergue, who are the present proprietors. The principal Hacienda is at Chirela, which lies at the entrance of the portals, through which the railroad will undoubtedly pass. This princely domain is a vast uncultivated tract, and gives employment only to a few *vagueros* who spend their time among the half-fed cattle which dot the barren hill sides of the Pass.

The inhabitants of this section are all of the tribe of Zapotecos, with the exception of those who occupy the village of El Barrio. These are a half-caste between the Indian and the Negroes, who were emancipated from the estates of Cortez. They are noted only for their idle habits and love of mischief.

One of the most interesting points in the Pass of Chivela is the thermal springs lying at the foot of the bleak and frowning Cerro Prido. This spring has its sources in one of the tributary streams of the Rio Verde, and is flanked on either side by perpendicular cliffs of compact limestone, which rise to a height of 200 feet. This defile is not more than two hundred yards in width at the point of greatest separation, and the surfaces of the grotesque rocks present the appearance of having been rent asunder in some fearful convulsion of the elements. High up, and near the summit of these over-hanging natural battlements, the green cactus and the clambering ivy, struggle together to hide the shrivelled faces of the rocks, which everywhere bear marks of the bloody sacrifices of the vultures, that build their nests in this wild and romantic spot. From midway down are the open entrances to innumerable caverns, penetrating into the mysterious depths of this weird-like mountain. Beneath, however, all is calm, and decked in spring-like beauty; clustering round the foundations of these rugged palisades, the passion-flower and the convolvulus twine themselves in loving embraces. The insubstantial acacia grows all along the borders of the stream, and mingles its odors with those

of the blossoming *suchil*. The springs are numerous, but in lieu of having a uniform source, they issue at irregular distances from between the boulders that lay huddled together in the bed of the river; they however have a common receptacle in the little azure lake, the thermal waters of which lave the foot of the canon. A crude chemical analysis, such only as I could make on the spot, showed the water to be impregnated more or less with potash, sulphur, and mineral salts, while its temperature ranged between 92° and 97° of Fahrenheit. The natives ascribe to this spring the most miraculous properties, and hundreds flock there annually from the remotest places—even Puebla—to enjoy a bath in its deliciously-tempered waters. At the head of this spring is an extensive cave, penetrating the rock for several hundred feet, and branching off into galleries, ante-chambers, and numerous other apartments. The entrance is partially concealed by huge rocks, at the bases of which is the figure of what it requires but a very little imagination to discover a crouched lion rudely hewn out of one of the masses of marble that lie scattered in the most grotesque heaps along the shores of the silvery stream. Entering the cave by a narrow passage-way, which is not unlike the wing entrance to a theatre, access is had to the main portal, over which is distinctly visible in the focus of the peering daylight, a gigantic red right hand; and painted along the arched passage-way underneath this, and overhead until completely lost in the darkness, is a series of hieroglyphics in two parallel lines. These bear a remarkable resemblance to the angular characters of the ancient Greek and Phœnician. From this cave in one of the galleries, I was enabled to obtain a curiously devised retort;* and since my return from the Isthmus, human bones and other vestiges have been discovered by those who have prosecuted the exploration. In the neighborhood of Santo Domingo, there are also numerous caves; the principal one is elevated about 700 feet above the base of the limestone moun-

tain which frowns upon the village, and is accessible only by a steep and circuitous path. The entrance to the cave has an arch spanning 80 ft. by 20 in height, and the plane of the floor cuts the horizon at an angle of 30°, until reaching a depth of 100 feet below. At the foot of this slope is a magnificent apartment some 300 feet in diameter, and 50 in height, with its sides ornamented with stalactites and stalagmites of every conceivable form and variety. Beyond this ante-chamber the cave extends into the mountain for a distance of over 1000 feet; sometimes expanding into large halls, or forming regular arched passage-ways several hundred feet in length; alternately ascending and descending into ridges and valleys. On the wall at the extreme end of the cave are several circular paintings, probably intended as imitations of the Calendar stones. There are also others of the sun and moon, and several representations of the human hand, besides bones, fragments of pottery and arrow-heads.

That gold exists in the Chivela Pass in very considerable quantities, there can be no reasonable doubt. But its discovery is far from being of recent date. It is a well-known fact that the crown on the statue of the Virgin in the church at Chihuitan is of pure gold, and that it came from the bed of the Rio Verde in the precise locality where the present discoveries have been made. This crown is upwards of fifty years old, and was fabricated at a time when Tehuantepec was a bustling town under the old Spanish regime. Some gold has also been found in the Almaloya; but up to this date a severe day's work has not yielded over three dollar's worth of the precious metal. It occurs in the ferruginous sands in the dry valleys and gorges, but the grains are very small, usually flattened scales, showing that in the original rock it is laminated. Some very fair specimens have been found in fragments of talcoze schist, with veins of quartz. This schist is invariably more or less decomposed, and stained with iron rust. The gold thus found in the cellular pockets of the quartzose rock, is associated with copper pyrites, specular iron ore

* Exhibited. Now in the possession of Judge Daly.

hematite, &c. It is impossible to say what results may follow from closer mineralogical inspections of the gold fields of the Isthmus. But one thing is certain, we know from the manner in which gold occurs here, that the mining thereof will be an expensive and tedious operation.

Every one who has passed over the road between Almaloya and the Rio Verde, has been struck with the strong resemblance which the country bears to the metalliferous tracts of Mariposa, and this remark was often made by the California passengers long before any gold was found. My own impressions are that silver is far more abundant in all that locality; and that the rock excavations, which will have to be made through the dividing ridge on the railroad line, will develop veins of incomparable richness. Galena exists almost everywhere in the Chivela Pass; and an antimonial sulphuret of silver occurs here and there with native copper.

The Zoques (still another tribe distinct in all respects,) inhabit the mountainous region to the extreme east, from the valley of the Chiapa on the South, to the Rio del Corte on the north. Originally occupying a small province lying on the confines of Tobasco, they were subjugated by the expedition to Chiapas under Luis Marin. At present they are confined to the village of San Miguel and Santa Maria Chimalapa. They are easily distinguished by the prominence of their features and the singular custom they have of shaving the crown of the head. Their love for liquor is inordinate, and their manners are coarse and vulgar, but they are patient, enduring, and industrious. On the cleared portions of the Sierra they cultivate large quantities of delicious oranges, maize, and tobacco; and their manufacture of articles from the ixtle and pita, is justly celebrated over the Isthmus. Mentally, they are deplorably ignorant, and their conceptions of the Deity and of religion, are vague and indefinite.

Passing to the southern division of the Isthmus, we find it particularly rich in antiquarian

remains. The road which leads from Oaxaca to Tehuantepec crosses a defile near *Mistequilla*, overhung by an eminence, called in the Zapoteco language *Guengola*, which means *large stone*.

When King Cosyoeza began his struggle for dominion against the Emperor Montezuma, he made on this hill, which he had previously fortified and well supplied with arms, ammunition and provisions, the brilliant defence which secured to him the sovereignty of the lands. It appears that in those times there were in the hill several springs of water, of which not the slightest trace now remains; but there are still to be seen splendid ruins of fortifications and vast barracks.

The Hill of Coscomate, near to Zanatepec, is called the hill of the sun and moon, from two colossal representations of these heavenly bodies, carved in the solid rock, which are described as illustrated by an inscription in unknown characters. The name of *Cerro del Venado* (deer-hill) is likewise attributed to an effigy of this animal being hewn out of one of the rocks. The old men who accompanied S'r. Moro in one of his expeditions to the upper *Ostula*, pointed out the situation of a valley about nine miles east of the Cerro del Venado, where they found the remains of a large town, with buildings of stone.

The cacique Cosijopi, at the beginning of his reign, offered up a solemn sacrifice to the greatest idol of Zapotecos, called the Heart of the Kingdom, which was placed on the island known as the Enchanted Hill, situated in the center of the Lagoons. The idols which were found in this island are of terra-cotta. Their character is very different from those made by the Aztecs, and some of them are not without merit. It is asserted that the Island of Tilema possesses several objects of archeological interest, and that in another island the remains of an abandoned town are still to be seen.

The Zapotecos, who numbered about 30,000 souls, constitute the greater part of the population of the southern division of the Isthmus, and are incomparably superior to those of any other portion. The salubrity of the climate,

the surpassing fertility of the soil, and the variety and richness of its productions, all minister to the prosperity of the inhabitants, who have, from the most remote periods of their history, been distinguished for their advances in civilization. Their knowledge of the mechanic arts was not limited, even in the days of the conquest, and their well fortified towns did not fail to attract the admiration, or excite the jealousies of the ancient kings of Anahuac.

Intellectually, the aborigines of Tehuantepec exhibit qualities of no mean order, and they are found to be intelligent, docile, and lively. In personal appearance, they are noted for the symmetry of their forms, the regularity of their features, and the vigor and sprightliness of their character. The women are delicately made, mercurial, voluptuous, and full of vivacity. They are particularly remarkable for the exquisite grace of their carriage, the winning softness of their manner of expression, and their love of gay costumes. In morals they are loose, and full of intrigue; but in habits they are temperate and industrious; many of them weave admirable fabrics from the wild silk and cotton, and their manufacture of conserves is unequalled in Mexico. The town of Tehuantepec gives employment to persons of various occupations, and its appearance is enlivened by the shops of carpenters, silversmiths, tanners, shoemakers, saddlers, and bakers. The manufacture of soap is very considerable, and the export of buckskins constitutes a lucrative trade.

The Indians of Juchitan, though numerically less than those of Tehuantepec, form an important part of the inhabitants of the Isthmus, as being superior in every respect. They are bold, independent, industrious and temperate, possessing great muscular strength, and a high degree of mental capacity.

The Huaves, who, according to their traditions, also came originally from Peru, and once a powerful race, have, from the successive struggles for supremacy with the Zapotecos, dwindled down to a little more than three thousand, scattered over the sandy peninsulas formed by the lagunes and the Pacific. They are

generally robust and well formed; some of them evince a high degree of intelligence, but the majority are grossly ignorant. The Huaves of both sexes are habitually in a state of almost complete nudity. Their industry consists of little else than fishing, and even this they can only do by means of sweep-nets. It is a singular fact that although the Huaves are chiefly fishermen, very few among them know how to swim.

They have an acute ear for music, and among the instruments which are peculiar to them is the *Marimbo*, an instrument formed of slats of hard wood, decreasing regularly in length like the *Pandean* of pipes according to the gravity or acuteness of the sound. The instrument is played upon by striking the slats with a sort of drumstick. They are isolated, and the blow produces a short, tinkling silvery note, like a stroke upon a glass tumbler. It contains three octaves, and each slat or stave is fastened on a frame over a series of wooden pipes, similar to the reed stops of an organ, by which arrangement body is added to the notes. Two drumsticks may be used, and thus harmony produced; and the instrument is even played upon by two performers, each using two sticks. When the performer wishes to change the register of the tones, he flattens certain notes by sticking on the respective slats a little piece of composition formed of wax and india rubber, thus obtaining a greater variety of combination.

Such, Gentlemen of the Geographical Society, are the inhabitants of the Isthmus of Tehuantepec, and such their customs and peculiarities hastily and imperfectly sketched forth. It cannot be denied that in the recital there is much to sadden every one who considers ever so slightly the resources of a country which might be great and prosperous, but which is now cursed with stagnation and death. Still, there are elements of power and of energetic and happy life in the land, which time cannot fail to bring forth and develope, for they await only the neigh of the iron horse to start up into healthful and beneficent activity.

NORTHMEN IN AMERICA.

Communicated by PROF. CH. C. RAFFN, and founded on his work "*ANTIQUITATES AMERICANÆ, sive Scriptores Septentrionales rerum Ante-Columbianarum in America,*" published by him in 1837 through the ROYAL SOCIETY OF NORTHERN ANTIQUARIES of Copenhagen.

The Dane Gardar, of Swedish origin, was the first Northman who discovered Iceland, in 863. Only a few out-places of this country had been visited previously, about seventy years before, by Irish hermits. Eleven years subsequently, or in 874, the Norwegian Ingolf began the colonizations of the country, which was completed during a space of sixty years. The colonists, many of whom belonged to the most illustrious and most civilized families in the North, established in Iceland a flourishing Republic. Here, on this distant isle-rock, the Old-Danish or Old-Northern language was preserved unchanged for centuries, and here in the *Eddas* were treasured those Folk-songs and Folk-myths, and in the *Sagas* those historical Tales and Legends, which the first settlers had brought with them from their Scandinavian mother-lands. Iceland was therefore the cradle of an historical literature of immense value.

The situation of the island and the relationship of the colony to foreign countries in its earlier period, compelled its inhabitants to exercise and develop their hereditary maritime skill and thirst for new discoveries across the great Ocean. As early as the year 877 Gunnbiorn saw for the first time the mountainous coast of Greenland. But this land was first visited by Erik the Red, in 983, who three years afterwards, in 986, by means of Icelandic emigrants, established the first colony on its south-western shore, where afterwards, in 1124, the Bishop's See of Gardar was founded, which subsisted for upwards of three hundred years. The chief firths or bays were named after the heads of the expedition. Erik the Red settled in Eriks-firth, Einar, Rafn and Ketil in the firths called after them, and Heriulf on Heriulfsnes. On a voyage from Iceland to Greenland this same year (986), Biarne, the son of the latter, was driven far out to sea

towards the south-west, and for the first time beheld the coasts of the American lands, afterwards visited and named by his countrymen. In order to examine these countries more narrowly, Leif the Fortunate, son of Erik the Red, undertook a voyage of discovery thither in the year 1000. He landed on the shores described by Biarne, detailed the character of these lands more exactly, and gave them names according to their appearance: Helluland (Newfoundland) was so called from its flat stones, Markland (Nova Scotia) from its woods, and Vineland (New England) from its vines. Here he remained for some time, and constructed large houses, called after him Leifsbudir (*Lief's Booths*). A German named Tyrker, who accompanied Leif on this voyage, was the man who found the wild vines, which he recognized from having seen them in his own land, and Leif gave the country its name from this circumstance. Two years afterwards Leif's brother, Thorwald, repaired thither, and in 1003 caused an expedition to be undertaken to the south, along the shore, but he was killed in the summer of 1004 on a voyage northwards, in a skirmish with the natives.

The most distinguished however of all the first American discoverers is Thorfinn Karlsefne, an Icelander, whose genealogy is carried back in the Old-Northern annals to Danish, Swedish, Norwegian, Scottish and Irish ancestors, some of them of royal blood. In 1006 this chief on a merchant-voyage visited Greenland and there married Gudrid, the widow of Thorstein (son of Erik the Red), who had died the year before in an unsuccessful expedition to Vineland. Accompanied by his wife, who encouraged him to this voyage, and by a crew of 160 men on board three vessels, he repaired in the spring of 1007 to Vineland, where he remained for three years, and had communications with the aborigines. Here his wife Gudrid bore him a son Snorre, who became the founder of an illustrious family in Iceland, which gave that island several of its first bishops. His daughter's son was the celebrated Bishop Thorlak Runolfson, who published the first Christian Code of Ice-

land. In 1121 Bishop Erik sailed to Vineland from Greenland, doubtless for the purpose of strengthening his countrymen in their Christian faith.

The notices given by the old Icelandic voyage-chroniclers respecting the climate, the soil and the productions of this new country are very characteristic. Nay, we have even a statement of this kind as old as the eleventh century from a writer not a Northman—Adam of Bremen; he states, on the authority of Svein Estridson, the King of Denmark, a nephew of Canute the Great, that the country got its name from the vine growing wild there. It is a remarkable coincidence in this respect that its English re-discoverers, for the same reason, name the large island which is close off the coast *Martha's Vineyard*. Spontaneously growing wheat (maize or Indian corn) was also found in this country.

In the meantime it is the total result of the nautical, geographical and astronomical evidences in the original documents, which places the situation of the countries discovered beyond all doubt. The number of days' sail between the several newly-found lands, the striking description of the coasts, especially the white sand-banks of Nova Scotia and the long beaches and downs of a peculiar appearance on Cape Cod (the *Kjalarnes* and *Furdustrandir* of the Northmen) are not to be mistaken. In addition hereto we have the astronomical remark that the shortest day in Vineland was 9 hours long, which fixes the latitude of $41^{\circ} 24' 10''$, or just that of the promontories which limit the entrances to Mount Hope Bay, where Leif's booths were built, and in the district around which the old Northmen had their head establishment, which was named by them *Hop*.

The Northmen were also acquainted with American land still farther to the South, called by them *Hvitramannaland* (the land of the White Men) or *Ireland-it-mikla* (Great Ireland). The exact situation of this country is not stated; it was probably North and South Carolina, Georgia and Florida. In 1266 some priests at Gardar in Greenland set on foot a

voyage of discovery to the arctic regions of America. An astronomical observation proves that this took place through Lancaster Sound and Barrow's Strait to the latitude of Wellington Channel. The last memorandum supplied by the old Icelandic records, is a voyage from Greenland to Markland in 1347.

EXPEDITIONS AND EXPLORATIONS.

1. *Paraguay Expedition*.—The United States' exploring steamer "Argentina," Captain Page, was to leave Buenos Ayres about the 20th April, for the Rio Paraguay, accompanied by the small steamer "Alpha." The expedition-vessels will proceed, in the first instance, direct to the sources of the Paraguay, and will then ascend the Pilcomayo. The "Argentina" will go as far as her draught will permit her, when the explorers will embark in the Alpha.

2. *Expedition from St. Paul to British Columbia*.—St. Paul, Minn., is situated in lat. 45° , and long. 93° ; Fort Thompson, in lat. 51° , and long. 122° west. Between these two points is an immense and little known region, comprising the valleys of the Minnesota, the Red River of the North, the Assiniboine, Lake Winnipeg, and both branches of the Saskatchewan. Beyond the latter are the Rocky Mountains, and west of the mountains, Fraser River, (the seat of the new gold region,) flowing into the Gulf of Georgia, opposite Vancouver's Island, and within a few miles of Washington Territory.

With a view to explore this region, an expedition is now being organized, and will set out early in June from St. Paul, for a thorough and careful exploration of the region described.

The route of the expedition will be direct to the headwaters of the Red River; thence by steamboat to Pembina; thence north-westerly to the great bend of the South Saskatchewan; thence to the sources of that river in or near the Kootenais Pass of the Rocky Mountains. This pass is in about lat. 50° north. It is proposed here to explore the eastern base of the mountains, prospecting for gold in the streams, and obtaining full particulars of the climate

and material resources of the country, as far north as Edmonton, on the north branch of the Saskatchewan. The exploring expedition will be accompanied by competent miners, in the expectation that gold deposits will be discovered. From Edmonton, the expedition will follow the express route of the Hudson's Bay Company to the Canoe Country, or the sources of Thompson River, where, close to the western base of the Rocky Mountains, the richest gold fields of British Columbia have been found. Here, if it be deemed expedient, the expedition will divide—one party going to the Pacific Ocean, and the other undertaking to explore the sources of the Columbia River and the region occupied by the Kootenais Indians. The latter party will return by Lewis and Clark's Pass, the Falls of the Missouri, and the valley of Milk River to Fort Mandan, and thence by Big Stone Lake and Fort Ridgeley to St. Paul. Both parties will return during the present season.

The expedition is fully equipped with scientific instruments, and is accompanied by several physicians. The cost is estimated at about \$300 per man. It is to be led by Messrs. Wm. H. Nobles, of St. Paul, and Geo. B. Olmstead, of Fort Ripley—the first-named in charge of the Columbia division, and the latter in charge of the Pacific division. The expedition was organized as a purely private adventure, but the City Council of St. Paul subsequently, by resolution, adopted the programme, and thus gave it somewhat of an official character.

3. *Another North-West Expedition.*—Several citizens of St. Paul have purchased the small steamer Jeannette Roberts, 112 tons burden, and of very light draft, and contemplate the unexampled task of conveying it into the waters of the Red River of the North; but between Big Stone Lake and Lake Traverse, the source of the Red River, there is a strip of low land about three-fourths of a mile wide, forming the divide between the two valleys, and which, in the spring season, is overflowed so as to permit at least of canoe navigation from one lake to the other. The depth of the water on

this portage is frequently from twenty to twenty-four inches, and this steamer, it is believed, can be got over. Once in Lake Traverse the course is free far into the British Possessions. It is the intention of the party about to attempt this exploit, to proceed at once to Pembina and Fort Garry. The expedition, it is proposed, will start on the 21st May, taking with them a year's outfit and provisions.

This expedition goes into a country mostly inhabited by Indians—the Sioux and Yankton tribes—who are friendly to the whites. If successful, it will open a lucrative trade not only with them, but also with Pembina and the Selkirk settlement. The course of the Pembina trade is at present by dog-trains, overland to St. Paul.

Eventually, another steamer will connect at the land pass between the two lakes, and form a continuous line between St. Paul and the Red River settlements. Captain Davis, now commanding one of the Prairie du Chien and St. Paul packets, has charge of the expedition, and intends to take along with him several ship carpenters to Lake Traverse; and there, converting his steamer into a saw-mill, spend the fall in preparing timber for building two other steamers, and have them ready by the spring of 1860.

4. *Survey of the St. Lawrence.*—The British Government has ordered an accurate survey of the Straits of Belleisle and the River and Gulf of St. Lawrence. The operations are to be superintended by Commander Orlebar, R.N. The work will be commenced as soon, and be continued to as late a date as the seasons will permit of. A part of the commander's force will be detached, for the purpose of re-examining and correcting the survey of the upper part of the river, made about thirty years ago. This is a most necessary and important work, more particularly as regards the lower part of the river. An accurate survey completed, and its dangers to navigation indicated by lighthouses and other nautical appliances where necessary, will do away with the evil repute which has ever attached to this

great navigable stream. It is the more necessary, since the St. Lawrence has become a common highway of trade from the teeming West to Europe; and it is equally with the Mississippi, the scene of a vast steamboating interest.

DEPARTMENT OF STATISTICS.

STATISTICS OF GUANO.

GUANO or "huanu" is a Peruvian or Quichua word, signifying "manure." In commerce the name is applied to a peculiar fertilizer, found in its greatest essential strength in rainless regions, and mainly on islands and rocky promontories. It is simply the dung or excrement of sea-fowls, (and sometimes of turtles and seals,) which has been accumulating through uncounted ages; and which on the group of Chincha, off the coast of Peru—according to Humboldt—has attained the enormous depth of 50 to 60 feet. In three hundred years, however, the deposits had not increased for more than a third to half an inch, and hence where the greatest accumulation has occurred, the process of formation must have been going on from times long anterior to either traditional or written history.

Though the true nature of this substance was not known to the civilized world before the visit of Humboldt to South America, it was well known to the subjects of the Incas; and in all the works relating to the ancient agriculture of the Peruvians, its value as a fertilizer is spoken of. The early navigators were also cognizant of the guano islands, and had seen cargoes of this deposit conveyed from the islands to the adjacent mainland, and witnessed its effects in stimulating the growth of crops.

On his return from South America in 1806, Humboldt transmitted samples of this substance to the chemists Fourcroy and Vauquelin of Paris. Their elaborate analysis, published in the "Annales de Chimie," (vol. 56,) introduced it fairly to the scientific world, and caused its real importance to be fully recognized. In 1810 Gen. Beatson, then on the Island of St. Helena, at the suggestion of Sir Joseph Banks, made an elaborate series of experiments with

guano on the potato, which were interesting alike from their novelty and from their useful results. But no practical application was made of this substance either in Europe or the United States until 1824, in which year the late Mr. Skinner, then editor of the *American Farmer*, received two barrels of it at Baltimore. This first importation into this country was distributed in small parcels for experiment; and one of the recipients, ex-Gov. Lloyd of Maryland, pronounced it to be "the most powerful manure he had ever seen applied to Indian corn."

Years elapsed, and no further means were taken to bring it into use. True, that in the meantime both Europe and North America had received samples from Peru, but only in such quantities as to constitute them rather matters of curiosity than utilitarian in purpose. In 1840, twenty barrels were received in England. But notwithstanding the astonishing results from its application to the soil, the fear that the enormous crops realized under its stimulus might exhaust the land of its productive elements, deterred the great body of the farmers from availing themselves of so valuable a fertilizer. Repeated experiments, however, at length convinced the most sceptical of the error of this prejudice, and at the same time that the new commodity was the safest, cheapest, and most potent of known manures. Its consumption now became general, and the guano trade expanded rapidly into a vast commercial and industrial interest.

The imports into the United Kingdom from the commencement of the trade to the end of the year 1857, amounted to 2,373,308 tons, and year by year as follows:

	Tons		Tons		Tons
1841....	2,881	1847....	82,392	1853....	123,166
1842....	20,398	1848....	71,414	1854....	235,111
1843....	3,002	1849....	83,438	1855....	305,061
1844....	104,251	1850....	116,925	1856....	191,501
1845....	283,300	1851....	243,014	1857....	288,362
1846....	89,203	1852....	129,889	(2,373,508 tons.)	

These figures, it must be understood, include also the quantities re-exported, which must have been to a considerable amount—chiefly to the continent of Europe. The principal sources from which this supply was procured, are noted

in the following table. The minor and indirect sources are aggregated under a common head.

Years ending 30th June.	W. Coast of Africa.	Br. Poss. in S. Afr.	Chile.	South America. Peru. Bolivia. Patag. a.	Other sources.
1841.....	1841.....	1841.....	1841.....	1841.....	1841.....
1842.....	1842.....	1842.....	1842.....	1842.....	1842.....
1843.....	1843.....	1843.....	1843.....	1843.....	1843.....
1844.....	1844.....	1844.....	1844.....	1844.....	1844.....
1845.....	1845.....	1845.....	1845.....	1845.....	1845.....
1846.....	1846.....	1846.....	1846.....	1846.....	1846.....
1847.....	1847.....	1847.....	1847.....	1847.....	1847.....
1848.....	1848.....	1848.....	1848.....	1848.....	1848.....
1849.....	1849.....	1849.....	1849.....	1849.....	1849.....
1850.....	1850.....	1850.....	1850.....	1850.....	1850.....
1851.....	1851.....	1851.....	1851.....	1851.....	1851.....
1852.....	1852.....	1852.....	1852.....	1852.....	1852.....
1853.....	1853.....	1853.....	1853.....	1853.....	1853.....
1854.....	1854.....	1854.....	1854.....	1854.....	1854.....
1855.....	1855.....	1855.....	1855.....	1855.....	1855.....
1856.....	1856.....	1856.....	1856.....	1856.....	1856.....
1857.....	1857.....	1857.....	1857.....	1857.....	1857.....
Total (17 yrs) 306,807	76,042	106,062	1,664,662	24,667	73,466
					122,383

The introduction of guano into the United States as a material of commerce and general consumption, dates later than into the United Kingdom. Indeed, it was only after an absolute proof of its success by the British farmer, that its use became common in America. But since this period, (1848,) the demand for it has been greater than the supply, and its use has been constantly on the increase. The following table exhibits the amounts imported, re-exported, and retained for each succeeding year:

Years ending 30th June.	Imported.	Re-exported.	Retained.
1848.....	1,013	..	1,013
1849.....	21,243	3	21,240
1850.....	11,740	4	11,736
1851.....	23,153	537	22,616
1852.....	60,054	430	49,624
1853.....	38,034	348	37,686
1854.....	175,849	386	175,463
1855.....	173,961	59,589	114,372
1856.....	66,746	994	65,752
1857.....	80,418	2,085	78,333
1858.....	75,197	2,153	73,044

Total (11 years) 707,408

66,529

640,879

The principal sources, direct and indirect,

whence these several amounts were derived, are shown in the annexed table:

Years ending 30th June.	North America.			West Indies.					South America.					Europe.		Africa.		Oceania.						
	Brit. Colonies.	Mexico.	Central America.	British.	Danish.	Dutch.	Spanish.	Brazil.	Buenos Ayres.	Chile.	Ecuador	New Granada.	Peru.	Uruguay.	Venezuela.	Other places.	England.		France.	Asiatic Ports.	Cape of Good Hope.	Other places.	Sandwich Isl'ds.	Other places.	Uncertain places.
1848	45	..	..	40	86	..	..	320	190	25	..	..	869	..	..	1,870	143	128	..	16	..	..	..	..
1849	1	..	..	743	..	..	..	..	..	..	..	..	17,347	..	..	6,850	..	..	..	..	..	..	..	..
1850	..	..	..	140	..	..	..	..	..	..	..	..	6,760	..	..	2,100	2	..	..	..	..	..	..	..
1851	..	..	300	8	..	..	..	1,928	220	1,710	9	..	85	20,059	40	..	..	..	..	..	..	..	..	..
1852	577	350	50	1	..	..	..	708	..	..	..	..	39,567	1,345	..	4,281	25	..	..	..	..	..	..	..
1853	6,876	..	..	1	..	..	..	708	..	..	..	..	200	25,582	330	..	..	..	148	..	..	..	..	..
1854	..	5,590	..	250	250	..	..	798	60	2,134	..	..	4,487	163,662	..	..	..	..	..	502	..	1,530	285	..
1855	..	480	..	330	370	..	225	4,051	300	894	..	..	4,526	155,046	250	5,355	1,300	..	..	..	209	260	376	..
1856	..	1	1,035	190	2,454	..	16	900	..	1,220	..	..	6,090	..	..	6,090	..	680	..	..	..	426	..	..
1857	..	5,596	700	1,242	65	6	1	970	..	801	525	..	810	64,559	..	3,240	..	..	..	..	..	1,903	..	..
1858	..	6,485	158	7,545	..	..	..	80	340	2,054	..	1,245	54,056	500	975	..	5	..	..	..	..	75	..	..
Total 7,500	19,536	1,398	12,754	770	21	427	9,755	1,110	8,947	525	15,756	585,945	2,455	15,660	15,401	209	808	148	518	1,739	2,919	925	2,428	..

The continent of Europe, with the exception, perhaps, of France and Spain, receives its supplies indirectly, chiefly by way of Great Britain; nor are statistics convenient to show to what amount it is used. The quantity shipped from Peru to Spain in 1858, was 27,160, and to France 25,545 tons—together about one-fifth of the whole exported from that country. The West India Islands are also consumers, and several of them producers also. Guano is also largely imported into Mauritius, and it is to this substance, in connection with the free importation of Coolie labor, that that island owes its rapid and sustained development. Guano is also largely used on the lands in Barbadoes—the dense population of which gives it also an abundance of labor. Mauritius and Barbadoes indeed have, from the two great elements of agricultural prosperity—guano and abundant labor—become the most flourishing sugar colonies of the British Empire, and in production have far outstripped the most prosperous of the countries in which slave-labor is used.

“Guano (we quote the Report of the Com. of Patents for 1854,) like all kinds of animal excrements, varies materially in its quality according to the nature of the food habitually used. The richer and more nutritious it is, the greater will be the fertilizing properties of the manure. Hence the dung of the highly-fed race-horse is more valuable than that of the drudge-horse released from the cart and kept upon low fare. For the very same reason the excrementitious deposits of birds feeding upon fish or flesh, afford a stronger manure than parrots or pigeons which live on berries and grain. Again, guano is very materially influenced by the age and climate in which it is found. Thus, during the first year of its deposit in Bolivia or Peru, the stratum is whitish and abounds in uric acid; but in the lower strata, which have existed perhaps for ages, the color is a rusty red, as if tinged with oxide of iron. They become progressively more and more solid from the surface downward—a circumstance naturally accounted for by the gradual

accumulation of the strata, and the evaporation of the volatile parts. In all climates subject to rains and heavy dews, the guano exposed to their influence undergoes fermentation, loses a portion of its ammoniacal salts by the decomposition, and thereby is diminished in value. The excrement of the birds, when first deposited, is rich in nitrogenous compounds. No ammonia, as such, exists among its constituents; but the access of air and moisture induces a slow decomposition by which ammonia is generated, and when the circumstances are favorable it escapes into the atmosphere. Wherever moisture is abundant these changes are most rapidly affected; whereas, on the other hand, a dry climate and a rapid accumulation of the deposit are more likely to insure its preservation in a comparatively unchanged state.”

From these remarks it is obvious that the composition, and consequently the value of the different kinds of guano, will vary according to age and the localities from which they are obtained. The varieties best known to commerce are the Peruvian, Bolivian, Chilian, Patagonian, Ecuadorian, Mexican, Central American, West Indian, and African, (Ichaboe and Saldanha Bay,) etc. They may also be classed in conformity with their chemical composition, or as follows:

Equadorian.....	} Ammoniacal.
Peruvian, (Chincha) ..	
Bolivian, (Angamos) ..	
Chilian, (fine).....	
Chilian, (ordinary) ..	} Intermediate.
Peruvian, (Lobos) ..	
Mexican.....	
West Indian.....	
Ichaboe.....	} Phosphatic.
Saldanha Bay.....	
Algoa Bay.....	
Patagonian.....	
Shark's Bay, (Aus.) ..	

Peruvian guano is found on the islands and coasts between the 6th and 21st degrees of south latitude. The government report of 1853 divides the huaneras or deposits into three grand sections: the *southern* embracing the coast from the limits of Bolivia to Arica; the *middle*, comprising those between Arica and

Callao; and finally, the *northern*, including the remainder between Callao and Paita.

The "southern section" bears the local names of Chipana, Huanillas, Punta de Lobos, Pabellon de Pica, Puerto Ingles, Iquique and Patillos, Punta Grande, etc. The *Chipana* deposit is situated in lat. $21^{\circ} 22'$ south, and consists of a table-rock from twenty-five to fifty yards above the sea. The *Huanillas* lies in lat. $21^{\circ} 18'$ south, and consists of four quebrados or valleys, in which are the deposits. The *Punta de Lobos* is a rocky point in lat. $21^{\circ} 06'$ south. The guano lies in the valleys in layers with a mean height of fifteen to twenty yards. The *Pabellon de Pica* is a tent-shaped hill near the village of Pica, in lat. $20^{\circ} 57'$. The guano of this deposit is found in crevices of varying depths. The guano of *Puerto Ingles*, about a quarter of a mile distant from the Pabellon, on a small peninsula, forms an eminence upwards of 500 yards long by 250 to 300 yards in breadth, on which are large huaneras. The islands of *Iquique* and *Patillos* lie to the north of the Pabellon and Puerto Ingles in lat. $20^{\circ} 46'$ south, the former in the bay of the same name. Both were important deposits in by-gone ages, but are now exhausted. The promontory in lat. $20^{\circ} 23'$ is called *Punta Grande*, and the guano is found in several valleys facing the sea. *Punta Grande* being in proximity to the Morro of Tarapaca, which is a kind of sand-hill, the guano in the deposit is covered with heavy layers of sand, and hence it is difficult to estimate its contents. These are said, however, to be immense; and there are many reasons also for believing that these deposits were used in the time of the Incas. Besides the deposits particularly noticed, there are smaller ones of white fresh guano upon different rocks and points between Iquique and Punta Grande, and at Pisagua—a small landing place to the north of the Punta, from which the manure is taken for the use of the coast region. There are also localities belonging to individuals. Probably the total amount of guano in the whole southern region, may be estimated at 10,000,000 tons, of which 7,921,407 tons have

been estimated for in the five first deposits, Chipana, Huanillas, Punta de Lobos, Pabellon de Pica and Puerto Ingles; and which are herewith recapitulated:

	Tons.
Chipana.....	280,602
Huanillas.....	1,912,505
Punta de Lobos.....	1,460,790
Pabellon de Pica.....	2,975,000
Puerto Ingles.....	1,292,510
Total.....	7,921,407

The "middle section" consists of the *Chincha Islands* in lat. $13^{\circ} 32'$ south, and nearly opposite to Pisco. Some guano is also found on the cliffs of Corredas and Viejos, and on the small island of Ballesta, but the quantity is small and not material to the estimate of the district. It is from these islands that the guano sent to foreign markets is chiefly extracted, and the quantity here accumulated is greater than in all the "huaneras" collectively. The quantity of manure on these islands has been variously estimated—in 1842 by Senor Jose Villa, in 1847 by Senor Rivero, and in 1853 by a government commission. The results of each estimate are herewith given:

	Estimate of Villa.	Estimate of Rivero.	Estimate of Government.
North Island ...	28,925,571	7,600,000	4,189,477
Middle Island ..	17,707,709	6,450,000	2,505,948
South Island ...		4,200,000	5,680,675
Total (tons) ..	46,632,280	18,250,000	12,376,100

An estimate by Admiral Moresby, (also in 1853,) reduces the amount to 8,600,000, of which 5,500,000 tons are attributed to the North Island, 1,500,000 tons to the Middle Island, and 1,600,000 tons to the South Island. Probably the estimate made by the government commission is nearest the truth. Taking this as the basis of calculation, and estimating the annual removal of the deposit at 300,000 tons, we arrive at the conclusion that the whole may be carried off in the next 41 years.

The "northern section" consists mostly of small islands, very low, and exposed to the winds. The layers of guano are not usually deep, and the deposits are frequently mixed with sand. They will eventually, however, become more valuable, as they are now the resort

of the vast clouds of birds which the operations at the Chinchá group have driven northward; and thus, when the wealth of the one section is exhausted, the other will supply its place. The islands of this section may be divided into four groups, viz.: the Lobos de Tierra, the Lobos de Fuera, the Guanape, and the island of Ferrol. The *Lobos de Tierra* ($5^{\circ} 06'$ S.) group consists of a principal island, and the islands of Bermeja, Felix Gonzales and Colorado. The *Lobos de Fuera* is two islands lying in lat. $7^{\circ} 03'$ S., and separated by a very narrow channel. The guano of this group is mixed with the excrements of the sea-lions, (*lobos*), which are here very numerous. The *Guanape Islands* are two in number, lying in lat. $8^{\circ} 36'$ S., and about five miles from the coast. Only the northern island contains guano. The island of *Ferrol* is a small island in lat. $9^{\circ} 07'$ S. The extent of the guano deposits on the islands of the northern section, as above defined, is shown by the following table:

Groups, etc.	Tons of guano.
Lobos de Tierra	477,858
Lobos de Fuera	265,743
Guanape Islands	79,800
Island of Ferrol	30,700

Total 854,101

Aggregating the sums of each of the three sections of the Peruvian deposits, the following will be the result:

Southern Section	7,921,407 tons.
Middle Section	12,376,100 "
Northern Section	854,101 "

Total 21,151,608 "

In addition to the deposits above enumerated, guano is also found in small quantities on the islands of Malabrido (lat. $7^{\circ} 49'$), San Martin or Dona Maria (lat. $11^{\circ} 04'$), Mazorque (lat. $11^{\circ} 25'$), Pescadores (lat. $11^{\circ} 46'$), Las Hormigas (lat. $11^{\circ} 56'$), and El Pelado in lat. $11^{\circ} 35'$ south. The island of Santa, in lat. $9^{\circ} 11'$, contains only a few tons of recent guano; but it is probably destined to become an important deposit, since, of late years, its large area has become the resort of myriads of birds, and the guano is rapidly accumulating.

These guano deposits are of immense value

to Peru, and the sale thereof yields to the nation five-eighths of the public income. In 1857 the income amounted to \$8,656,256, of which \$5,296,952 were derived from this source. The quantity shipped during the years 1856-'57, and 1857-'58, and the destination of the material, is stated as follows:

Destination.	1857-'57.	1857-'58.
England and the Continent	181,134	151,333
Spain	7,874	27,160
France	14,101	25,545
Australia .....	.....	1,523
Mauritius .....	.....	7,228
United States	51,943	51,253
Barbadoes .....	.....	2,667
Asia	1,929	.....

Total (Peruvian tons) .. 256,981 266,709

Bolivian (or Angamos) guano is found in many spots along the coast bordering on the desert of Atacama. Pacquica is the principal port from which it is shipped. As a fertilizer it ranks next to the guano of the Chinchá Islands, being the product of a region but a few degrees southward, and in which rain never falls. But the deposits are frequently buried in sand, and the guano oftentimes mixed or adulterated therewith. These circumstances add largely to the cost of shipping, and have tended greatly to depreciate its real value in the markets. The shipments have been wholly on British account, and up to 1858 had amounted only to 24,667 tons.

Chilian guano has been found chiefly in the vicinity of the desert of Atacama, on the northern frontier—is generally of a very inferior quality, and the deposits may be said to be nearly exhausted. There are, however, other deposits further south; and another and a very valuable variety, although rare, is exported from Valparaiso. This latter is said to be collected from the rocks, and is a recent deposit. It is quite hard, and comes to this country in large pale-yellowish masses, and in value is said to be equal to that of the best Peruvian. Between 1848 and 1858, both years inclusive, only 8,847 tons of Chilian guano have been imported into the United States.

Patagonian guano is inferior in value to that found on the coasts nearer the equator, inas-

much as the deposits have been deprived of their salts by the frequent rains of the climate. The guano of this region indeed is almost wanting in ammonia; and it is always mixed with sand, sometimes to the amount of one-third the unit. Very little, if any, of this deposit has been brought to the United States, and to 1858 only 73,485 tons had been landed in England.

Equadorian guano is brought from the Galapago Islands, which belong to the Republic of Equador. This group lies some six hundred miles west of the mainland, and consists of four considerable and a large number of smaller islands and islets. The shores abound in turtle, (hence the name, Galapagos,) and are frequented by myriads of aquatic fowls. From the latter the guano of these islands is derived. Of this deposit only 525 tons have reached the United States. It is, however, according to the analysis of Prof. Horsford, rich in ammonia, the sample examined by him having contained 15.59 per cent. of that substance; and hence it probably ranks with the average qualities of the Peruvian stock. The islands near the Equadorian coast, and also those near the coast of New Granada on both seas, contain deposits of this fertilizer of greater or less extent.

Mexico and Central America have deposits on the headlands and islands on both the east and west coasts. The locality will vary in the composition of the several varieties. In some parts of the Pacific coast, where the climate is nearly rainless, the deposits will be essentially ammoniacal. Where the rains are frequent and heavy, their value will depend on the amount of their phosphates. But as yet little is known of these brands. On the Pacific side the largest known deposits have been found on the three islands called the Marias. In the vast stretch of coast from the Isthmus of Darien to the head of the Gulf of California, however, there is ample space for future discovery. On the Atlantic side of these countries, the guano is of an entirely different character from that found on the Pacific coast, and in some instances has yielded as much as 60 per cent. of the phosphate of lime. The island group called the

Triangles, near the coast of Yucatan, is the chief known source of Mexican guano. Small shipments have been made annually into both England and the United States since 1851.

West Indian guano is found abundantly on the solitary rocks and islets which stud the Caribbean Sea, and the neighboring ocean. The island of Aves, or Bird Island, (the possession of which is now contested between the Venezuelan and Dutch governments,) is the richest source of phosphate guano hitherto discovered. Some samples have yielded 84 per cent. of dry super-phosphate of lime, or one-third more than pure ground bones. It is very remarkable for its little moisture. Of dry organic matter and ammonia, the proportion is $6\frac{1}{2}$ per cent. There are also workable deposits on Navasa island off the southwest peninsula of Hayti; and there are large deposits on the peninsula of Samana, and also on the Florida Keys. With the exception, however, of the Bird Island deposit, these have not been disturbed. The guano of this island is known to commerce as Venezuelan.

Western and Southern Africa have yielded large quantities of guano, which have been collected chiefly at two points, Saldanha Bay and Ichaboe. The guano of Saldanha Bay, like that of Patagonia, comes from a latitude and climate subject to heavy rains, and consequently loses the greatest part of its ammonia, unless collected in a very recent state. It derives its chief value from its phosphates, which range higher than those of any other known variety except those of Mexico and the West Indies. Ichaboe guano is now nearly exhausted, and where found in the markets is a recent deposit made from day to day, and collected by hand from the rocks. This new guano is much more valuable than the old, the latter having been exposed to the wind and rain of centuries, and lost nearly all its ammonia. It approaches in composition that of the Chincha Islands, but it is remarkable as containing a considerable percentage of carbonate of lime, which is entirely wanting in the Peruvian variety.

In the course of our remarks, we have incidentally referred to the composition of the sev-

eral varieties as ascertained by analysis. It may now be proper to compare the results, as on their composition depends their value. The analyses that appear in the following table will suffice for this purpose:

	(a) Dr. Thomas Anderson's analysis. Raymonde of Lima.		(b) Kensington Laboratories. (c)	
	new, (a)	old, (a)		
Chincha, (a)	13.73	23.48	7.97	1.66
" (b)	9.30	67.30	9.60	0.75
Lobos, (c)	12.50	22.00	12.25	12.35
" (c)	16.50	23.50	16.27	2.50
" (c)	13.35	36.65	11.17	1.50
Bolivian, (a)	15.79	56.09	6.81	6.03
Chilina, fine, (a)	6.06	54.51	10.25	15.85
" inferior, (a)	15.09	12.88	6.04	40.52
Patagonian, (a)	24.36	18.86	2.70	7.56
Saldanha Bay, (a)	21.03	14.93	6.10	1.54
" (b)	14.47	7.85	33.67	14.47
Ichaboe, old, (a)	24.21	39.30	4.19	2.30
" new, (a)	18.89	32.49	6.91	19.59
		19.63		2.49
	Water.	Organic Matter and Am. Salts.	Alkaline Salts.	Sand.
	Phosphates.			Lime.
				Sulphuric acid.
				Proportion of Ammonia.
				17.00
				18.87
				4.26
				4.35
				6.42
				19.71
				18.80
				2.11
				2.69
				1.62
				0.47
				8.50
				10.42

The great variation in the several guanos is thus made clearly apparent. But practically there are only two constituents which commerce recognizes as valuable—the *ammonia* and the *phosphates*. Knowing the cost of these materials in the market, we may therefrom easily deduce the money-value of any of the guanos severally. Thus, ammonia is worth about fifteen cents a pound, and the phosphates about two cents a pound. In Chincha Island guano we find seventeen per cent. of the former, and 23.48 per cent. of the latter commodity. Hence,

340 pounds of ammonia at 15 cents per lb. \$51.00
470 " " phosphates at 2 " " 9.40

gives the value of a ton (2,000 lbs.) of Chincha guano at \$60.40.

In the same manner we find the value of a ton of Saldanha Bay guano, (containing .1.62

per cent. of ammonia and 56.4 per cent. of phosphates,) to be \$28.42, thus—

32.4 pounds of ammonia at 15 cents per lb. \$4.86
1128.0 " " phosphates at 2 " " 23.56

Strictly speaking, however, the alkaline salts have some value, say a half a cent per pound, and this may be added according to the proportion present in the samples examined.

It may be proper here to see how far the theoretical prices agree with the actual market prices. In the Liverpool market of the 18th March, 1859, the quotations were as follows:

Peruvian (Chincha).....	£12 00s. to £12 10s.
" (Upper or Bolivian)...	7 10 to 8 00s.
Ichaboe	5 00 to 6 00s.
Patagonia	3 10 to 4 10s.
Saldanha Bay.....	5 10 to 6 10s.

and it may be stated that in the New York market, Peruvian guano brings from \$60 to \$65 per ton. These figures confirm essentially the correctness of the method of valuation adopted.

Hitherto, we have not alluded to the sources of guano in the Pacific Ocean. These are new, and comparatively unknown, and have mainly, if not altogether, been discovered by American explorers, who, under the stimulus of the act of Congress, passed 18th August, 1856, have organized expeditions to search for this valuable commodity.

The act alluded to was passed for the protection of those who risked their lives and fortunes in these adventures. It provides that, "when any citizen or citizens of the U. S. may have discovered, or shall hereafter discover, a deposit of guano on any island, rock or key, not within the lawful jurisdiction of any other government, and not occupied by the citizens of any other government, and shall take peaceable possession thereof, and occupy the same, said island, rock or key, may, at the discretion of the President of the U. S., be considered as appertaining to the United States." The discoverer must give notice to the State Department, noting the latitude and longitude of the island, rock or key discovered, and furnish satisfactory evidence of the date of discovery, and of the taking possession and occupation thereof, etc.

Congress alone can grant the *exclusive* right of occupation for the purpose of obtaining and of selling the guano to citizens of the United States; but "nothing in this act contained shall be construed obligatory on the United States to retain possession of the islands, rocks or keys aforesaid, after the guano shall have been removed from the same." The trade between the islands and the ports of the United States is to be considered as a branch of the coasting trade, and regulated as between different parts of the United States. The President is authorized, at his discretion, to employ the land and naval forces to protect the rights of discoverers; and, "until otherwise provided by law, all acts done, and offences or crimes committed on every such island, or in the waters adjacent thereto, shall be held and deemed to have been done or committed on the high seas, and be punished according to the laws of the United States.

The advantages of this law to the American merchant and navigator are apparent, and have been followed by a vast amount of exploration and discovery, both by individuals and associations. Up to the commencement of 1859, no less than forty-nine guano islands and island groups have been discovered in the Pacific Ocean, and taken possession of by Americans. These are named in the following list, (all notified to the State Department,) which also gives the astronomical position of each:

	Latitude.	Longitude.
Baker's	0° 15' S.	176° 21' W.
Jarvis'	0° 21' S.	159° 52' W.
Howland	0° 50' N.	176° 52' W.
Malden's	4° 15' S.	155° 00' W.
Arthur's	3° 32' S.	176° 05' W.
Christmas	1° 58' N.	157° 32' W.
Caroline	9° 54' S.	150° 07' W.
Ann's	9° 49' S.	151° 15' W.
Staver's	10° 05' S.	152° 16' W.
Flint's	11° 26' S.	151° 48' W.
Bauman's	11° 48' S.	154° 10' W.
Rogewein's	11° 00' S.	156° 07' W.
Groninque	10° 00' S.	156° 44' W.
Friehaven	10° 00' S.	156° 59' W.
Quiro's	10° 32' S.	170° 12' W.
Low	9° 33' S.	170° 38' W.
Clarence	9° 07' S.	171° 40' W.
Favorite	2° 50' S.	176° 40' W.
Duke of York	8° 30' S.	172° 10' W.
Farmer's	3° 00' S.	170° 50' W.

	Latitude.	Longitude.
Birnie's	3° 35' S.	171° 39' W.
Phenix	3° 40' S.	170° 52' W.
Mary's	2° 53' S.	172° 00' W.
Enderbury's	3° 08' S.	174° 14' W.
Sydney	4° 20' S.	171° 00' W.
Penbryn's	8° 55' S.	158° 07' W.
Pescado	10° 38' S.	159° 20' W.
Ganges	10° 59' S.	160° 55' W.
Rierson's	10° 10' S.	160° 53' W.
Sideron's	11° 05' S.	161° 50' W.
Humphrey's	10° 40' S.	160° 52' W.
Frances	9° 58' S.	161° 40' W.
Flint	10° 32' S.	162° 05' W.
Nassau	11° 32' S.	165° 30' W.
Danger	10° 00' S.	165° 56' W.
Mary Letitia's	4° 40' S.	173° 20' W.
Kemin's	4° 41' S.	173° 44' W.
Walker's	3° 58' N.	149° 10' W.
Sarah Anne	4° 00' N.	154° 22' W.
America	3° 40' N.	159° 28' W.
Prospect	4° 42' N.	161° 38' W.
Samarang	5° 10' N.	162° 20' W.
Palmyro	5° 48' N.	162° 20' W.
Danger	6° 30' N.	162° 32' W.
Makin	3° 02' N.	172° 46' W.
Mathew's	2° 05' N.	173° 26' W.
David's	0° 40' N.	170° 10' W.
Barber's	8° 54' N.	178° 00' W.

The two first-named islands have been claimed by the American Guano Company, and the rest by the United States' Guano Company, and individual citizens of the United States.

These acquisitions are all to be surveyed and charted, and the quality and quantity of the guano thereon, to be ascertained by competent analytical chemists and topographical engineers, and a report thereof made to Congress at the earliest practicable period. At some of these islands there are good harbors and safe anchorage, and at others of them there is a good lee; which conditions, coupled with the fact that generally they are situated where storms are seldom known (the prevailing winds being from the east), make them places of safe resort for ships.

The quantity and accessibility of the guano on many of these islands is placed beyond doubt. What remains to be demonstrated is its quality, and whether that is such as to warrant its importation. Generally the guano of the Pacific Isles is that classed as phosphatic, and contains also sulphate of lime and other salts. Little, however, has been brought into the Atlantic States. In 1857 some seventy or eighty tons were imported into New York in the ship

Aspasia; and yet, with such limited quantity, experiments have been made which have proved its value as a fertilizer; and its success has led to a demand which will insure an immediate and thorough trial of its powers.

The accounts of the operations of the companies and individuals operating in the Pacific are very meagre, and not at all connected. From the latest, which appear in the "N. Y. Tribune" of the 28th May, 1859, we learn that the American Guano Company (which has its Pacific headquarters at Honolulu, and its principal seat in New York) has been very successful at Jarvis' Island, and had already carried into Honolulu between 13,500 and 14,000 tons of guano. Considerable quantities had also been landed at San Francisco. The value of this guano in New York is about \$40 per ton.

From the brief survey of the localities of this material of commerce, which it has been the object of this paper to portray, it is evident that, in one form or other, guano is not that scarce article which our incomplete information would lead us to prejudge. It is found, indeed, in all the solitudes of the earth, and is daily being accumulated, and will ever be on the increase, so long as the sea-bird finds a home on the coasts and promontories, or on the islands of the great ocean. The demands of commerce and agriculture, be they ever so vast, cannot, therefore, exhaust the rich stores of nature. They may clear away existing deposits—laying bare the rocks which are now covered with the animal refuse of ages, but again and again, so provident is nature, and so prodigal in her gifts to man, will the bird return to its habitat, and renew, layer by layer, the so valued mass; and when driven away for a time, it but seeks another scene for its operations. In all this may we not trace the hand of a wise Providence, who thus has provided a panacea against the improvidence of man, and stored up a treasure that brings fertility and productiveness to the lands which, through ignorance and folly, he has converted into a wilderness, and rendered unfit for his habitation. R. S. F.

STATISTICS OF AMERICAN STATES.

NO. 6.

REPUBLIC OF URUGUAY.

Lat. 29° 20' to 34° 58' S. Populat'n (1856), 177,300.
Long. 52° 38' to 56° 31' W. Density, 2.41 to sq. mile.
Area, 73,538 sq. miles. Capital, MONTEVIDEO.

GOVERNMENT.

Executive.—President, elected for four years. The present President, Don Gabriel Antonio Pereira, was elected on the 1st March, 1856. The Vice-President (Don Bernardo P. Borro) is elected for the same term as the President.

Administration.—The Ministers—1st, of foreign relations and internal administration; 2d, of finance, and 3d, of war and marine.

Legislature.—A Senate and House of Representative, the members of which are elected by the people.

Judiciary.—A Supreme Court at Montevideo, and courts of superior jurisdiction at Montevideo, Colonia and Maldonado.

Religion.—The Holy Apostolic Roman Catholic.

POPULATION IN DEPARTMENTS.

Departments.	1856.	1829.	Incr.
Montevideo	43,520	23,404	20,116
Guadalupe (Canelones) ..	13,600	7,800	5,800
San Jose	13,500	8,080	13,820
Florida	9,400		
Colonia del Sacramento ..	10,320	9,706	614
Soriano	13,200	13,200	....
Paysandu	11,200	27,900	6,660
Salto	14,300		
Tacuarembó	9,060	10,100	....
Cerro Largo	10,100		
Maldonado	12,600	21,296	604
Minas	9,300		
Durazno, or Entre Yi y Rio Negro	8,200	6,826	1,374
Total	177,300	128,312	48,988

Chief Towns.—Montevideo, Colonia and Maldonado. Montevideo has about 35,000 inhabitants. Besides these, there are 15 smaller towns, and 8 pueblos.

FINANCES (1856).

Receipts.....	\$2,132,800	} Deficit, \$1,147,945
Expenditures	3,280,745	
Public Debt (1853)	about \$10,000,000	

COMMERCE (1855-'56).

I.—Value of Exports and Imports.

Years.	Imports.	Exports.	Total.
1855	\$4,504,987	\$8,791,249	\$13,296,236
1856	4,596,317	10,303,853	14,890,170
Increase ..	\$81,330	\$1,512,604	\$1,593,934

2.—*Domestic Produce Exported 1852-'55.*

Products.	1852.	1853.	1854.	1855.
Seal oil Casks,	53	104	94	
Ox horns 1,000 ds. . . .	659	773	571	542
Bones 1,000 ds. . . .	420	889	241	442
Beef qqtls. . . .	20,420	37,444	43,780	62,774
Ashes tons,	940	940	4,355	6,968
Hair 25 lbs. . . .	28,980	76,810	58,210	34,290
Cow hides, dry - No. . . .	479,496	650,179	325,522	269,261
" salt.. "	113,563	111,831	106,546	113,664
Horse hides, dry - "	86,970	191,456	114,993	96,444
" salt.. "	26,926	102,250	71,250	82,312
Hides, slunk.... "	7,256	8,854	2,920	3,317
Skins, seal.... "	12,875	9,109	3,450	6,596
" hog..... "	86	908	....	326
" ass..... "	128	95	304	200
" deer..... doz. . . .	....	....	....	2
" sheep .. "	1,350	14,261	9,808	6,094
" otter..... "	90	1,170	330	145
" goat..... "	200	1,250	30	....
Beasts' claws "	111,500	146,600	87,500	112,556
Grease qqtls. . . .	1,866	1,631	930	1,394
Wool 25 lbs. . . .	59,620	183,150	51,010	48,080
Mules and mares-No. . . .	315	1,095	1,569	3,022
Hoofs 1,000 ds. . . .	85	233	61	45
Feathers lbs. . . .	7,500	23,000	5,100	4,500

3.—*Distribution of Principal Exports, 1855.*

Staple Products.	Brazil and Havana.	Bolivia.	Spain.	United States.	France.	Great Britain.	Genoa and Marseilles.
Horns.....	1,000 ds.	73	...	23	141	169	138
Bones.....	"	2,120	...	1,680	20,380	30	417
Hair.....	25 lbs.	2,120	...	1,680	20,380	7,850	2,260
Hides, dry cow.....	No.	1,008	52,654	39,301	86,907	1,462	60,907
" " salted cow.....	"	7,500	6,948	7,278	29,207	58,039	11,633
" " dry horse.....	"	569	18,141	6,848	2,084	43,064	553
" " salted horse.....	"	6,798	1,528	6,469	22,190	46,469	5,322
Sheep skins.....	doz.	1,050	5,500	5,000	3,040	150	1,854
Beasts' claws.....	No.	45,209	5,500	5,000	66,856	2,540	1,385
Grease.....	9 lbs.	91,270	...	...	10,630	35,160	10,465
Wool.....	25 lbs.	14,170	...	...	10,630	19,160	4,138
Horns.....	1,000 ds.	...	...	...	...	5	4
Feathers.....	lbs.	...	...	...	...	4,500	...

4.—Distribution of Imports in 1855.

Country.	Wines and Spirits.	Pro- visions.	Manufac- tures, etc.	Total.
England	\$35,200	\$8,200	\$504,400	\$547,800
France	83,600	16,800	632,800	733,200
Spain	358,000	31,000	159,800	548,800
Brazil	135,400	76,800	161,800	374,000
U. States	10,000	15,000	246,600	273,500
States of Italy .	38,200	16,800	120,600	175,600
La Plata (<i>Buenos Ayres</i>) . .	2,800	...	163,400	166,200
Other countries .	149,400	66,600	950,200	1,166,200
Total . . .	\$934,200	\$431,200	\$3,239,600	\$4,605,000

5.—*Navigation*, (1855).

Arrivals	1,593 vessels.	183,779 tons.
Departures	1,514 "	187,570 "

6.—*Distribution of Shipping* (1855).

Countries.	Arr. and Dept.	Tons.
Great Britain	200 vessels.	59,186
France	179 "	50,097
United States	145 "	44,855
Spain	194 "	36,010
Sardinia	169 "	34,840
Brazil	100 "	20,236
Hamburg	66 "	16,016
Buenos-Ayres	158 "	12,852
Other foreign countries	415 "	41,006
Total foreign	1,626 "	315,098
In coasting trade	1,481 "	56,251
Total	3,107 "	371,349

7.—Commerce with United States.

(From the Report of the Register of the Treasury.)

Years.	Exports	Imports	Shipping.	
	from U.S.	into U.S.	Entered.	Cleared.
1849.....	\$147,727	\$79,924	1,609 tons.	4,980 tons.
1860.....	61,542	.....	1,275 "	2,034 "
1861.....	45,789	19,114	2,146 "	2,267 "
1862.....	193,073	49,707	2,508 "	6,443 "
1863.....	308,446	302,980	3,660 "	10,056 "
1864.....	512,957	457,179	3,980 "	19,643 "
1865.....	422,172	242,709	6,317 "	19,721 "
1866.....	551,329	361,036	2,056 "	13,319 "
1867.....	1,006,172	368,297	2,530 "	24,439 "
1868.....	578,128	621,888	4,705 "	14,544 "

WEIGHTS, MEASURES AND MONEYS.

Old—The system of Spain.

New—The French metrical system.

The English yard and gallon are also in use at Montevideo. [R. S. F.]

HUMBOLDT COMMEMORATION.

A special meeting of the "American Geographical and Statistical Society," in commemoration of their most illustrious fellow member, the late Baron Humboldt, will be held on Thursday evening, June 3d. Professors Lieber, Ruche and Guyot will deliver addresses.

ELEMENTARY STATISTICS OF EUROPEAN STATES.

No. 3.

PUBLIC FINANCE: RECEIPTS, EXPENDITURES, DEBTS, Etc.

States, etc.	Date of Return.	Aggregate Receipts into the Treasury.	Expenditures on account of—			Amount of Public Debt.	Normal unit, & rate of conversion.
			Public debt.	Army and Navy.	Total, inc. all others.		
Andorre	—	50,000	....	....	50,000	....	....
Anhalt-Bernburg.....	1858	795,960	....	....	795,960	2,035,624	thaler=0.72
Anh.-Dessau-Koethen ..	"	1,212,836	....	....	1,212,836	1,705,773	"=0.72
Austrian Empire.....	1857	149,147,923	45,693,498	53,445,009	170,414,858	1,208,000,000	florin=0.50
Baden*.....	1858	6,693,294	....	....	6,623,643	38,580,688	"=0.41
Bavaria*.....	1856	16,234,940	5,214,913	3,721,119	16,972,713	84,630,422	"=0.41
Belgium.....	1858	26,887,052	7,187,805	6,291,280	26,033,054	131,785,475	franc=0.19
Bremen.....	"	1,051,037	208,291	120,925	1,095,925	6,791,700	thaler=0.80
Brunswick*.....	"	3,379,320	....	....	3,379,320	6,935,325	"=0.72
Denmark.....	"	9,242,358	3,321,972	3,481,383	9,201,858	62,136,720	"=0.54
Frankfurt*.....	"	1,030,150	274,874	221,512	979,491	7,030,250	florin=0.50
French Empire.....	"	337,044,632	100,787,002	112,972,206	335,674,382	1,526,078,568	franc=0.19
Great Britain, etc.....	"	325,831,262	137,410,085	151,224,749	337,818,523	3,740,280,000	£ stg.=4.80
Greece.....	1857	3,106,802	272,921	1,122,369	3,050,879	19,125,000	drachm=0.17
Hamburg.....	1858	2,024,229	....	....	2,153,366	22,656,767	mark=0.29
Hanover.....	"	13,758,182	1,506,327	1,863,720	13,826,354	33,273,579	thaler=0.72
Hesse-Cassel*.....	"	3,585,082	330,235	810,526	3,602,628	8,135,244	"=0.72
Hesse-Darmstadt*.....	"	3,511,963	....	....	3,479,872	7,548,797	florin=0.41
Hesse-Homburg*.....	"	154,917	....	....	177,265	434,071	"=0.41
Holland (Luxemb'g*) ..	"	30,399,119	13,601,379	4,727,218	29,089,358	463,851,544	"=0.41
Ionian Islands.....	1856	1,830,917	10,766	120,000	1,736,605	1,440,000	£ stg.=4.80
Lichtenstein.....	—	29,700	....	....	29,700	....	florin=0.54
Lippe-Detmold.....	—	324,000	....	....	324,000	252,000	thaler=0.72
Lubeck.....	1858	301,780	107,800	30,320	301,280	2,490,200	marc=0.28
Mech'b'g-Schwerin } ..54	1,580,519	....	....	....	1,646,413	3,697,581	florin=0.48
Mech'b'g-Strelitz } ..54	1,598,588	....	....	....	1,658,345	....	lira=0.19
Modona.....	1851	20,000	....	....	20,000	....	....
Monaco.....	—	20,000	....	....	20,000	....	....
Nassau*.....	1858	2,318,521	....	....	2,318,521	3,790,000	florin=0.50
Oldenb'g & Kniph'en ..	"	1,827,345	....	....	1,825,229	2,724,480	thaler=0.72
Parma*.....	"	1,844,140	....	....	1,844,140	2,257,200	lira=0.19
Portugal.....	"	74,403,961	3,896,580	4,504,388	15,277,533	118,432,256	milrea=1.18
Prussia*.....	"	91,015,040	9,503,892	22,771,776	91,015,040	176,268,286	thaler=0.72
Reuss-Greiz.....	—	43,750	....	....	43,750	....	"=0.72
Reuss-Schleitz.....	—	189,360	....	....	187,200	352,080	"=0.72
Roman States.....	1858	15,541,813	4,805,078	2,146,757	15,391,223	70,459,550	scudo=1.06
Russian Empire.....	1852	220,377,600	26,800,000	77,916,000	220,668,000	1,043,414,123	S. rouble=0.80
San Marino.....	—	6,360	....	....	4,240	....	scudo=1.06
Sardinia.....	1858	27,546,679	9,488,050	7,275,614	28,262,035	128,633,843	franc=0.19
Saxe-Altenburg*.....	"	534,773	....	....	532,659	787,122	thaler=0.72
Saxe-Coburg-Gotha* ..	"	416,880	....	....	416,880	781,693	"=0.72
Saxe-Meiningen*.....	"	674,122	....	....	664,169	1,721,764	florin=0.41
S-Weimar-Eisen'ch* ..	"	1,116,595	201,189	26,413	1,111,854	4,055,169	thaler=0.72
Saxony*.....	"	6,742,975	326,001	1,421,869	6,636,896	44,153,289	"=0.72
Schaumb'rg-Lippe* ..	—	164,160	....	....	164,160	....	"=0.72
Schwartzb'g-R'd't 1858	—	330,374	....	....	327,562	....	florin=0.41
Schwartz'g-Sond.	—	384,802	....	....	379,811	1,116,015	thaler=0.72
Spain.....	"	99,207,774	12,057,978	22,253,607	99,207,774	732,205,548	real=0.05
Sweden.....	"	7,412,916	....	3,339,950	7,142,838	....	R. M. thaler=0.28
Norway.....	"	5,185,040	276,090	1,674,400	5,185,040	4,910,416	Sp. thaler=0.12
Switzerland (fed.) 1857	—	3,721,091	60,737	272,382	3,050,664	1,937,698	franc=0.19
Turkey.....	1854	34,602,000	....	14,673,000	34,602,000	548,559,200	piastre=4.38
Tuscany.....	1858	6,219,216	....	1,328,268	6,218,944	....	lira=0.16
Two Sicilies.....	1856	26,249,896	....	....	26,518,191	101,153,760	ducat=0.83
Waldeck.....	1857	267,527	....	....	278,524	....	thaler=0.72
Wurtemberg*.....	1858	6,920,538	....	....	6,918,591	21,988,133	florin=0.41

* Custom's Revenue of the Zollverein States, 1857:—Prussia, \$12,017,376; Luxemburg, \$64,944; Bavaria, \$70,408; Saxony, \$1,900,080; Hanover with Schaumburg Lippe, \$1,533,616; Wurtemberg, \$292,679; Baden, \$602,332; Hesse-Darmstadt, \$204,048; Hesse-Cassel, \$408,240; Thuringian States, \$232,776; Brunswick, \$205,992; Oldenburg, \$186,768; Nassau, \$47,169; Frankfurt, \$656,856. Total, \$19,153,512.

† Debt as returned in 1858.

[R. S. F.]

LIBRARY DEPARTMENT.

BOOKS, MAPS AND CHARTS, ETC.,
Purchased and donated since last Report.

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NASHVILLE—(*Presented by the Mayor of Nashville.*)

—Catalogue of the University of Nashville, 1858-9: pamphlet, 8vo., pp. 24.

—First Annual Announcement of the Medical Department of the University of Nashville, 1857. 1 pamphlet, 8vo., pp. 8.

NORTH AMERICA—(*Presented by Edward Peltz, Esq.*)

—Neuer Praktischer Wegweiser für auswanderer nach Nord-Amerika in drei abtheilungen mit Karten, planen und ansichten. Von Captain B. Schmolder. Mainz, 1849, (3 vols. in one,) 8vo. pp. 120, 154, 106, cloth.

EUROPEAN STATES—(*Presented by the same.*)

—Der Papst und sein Reich oder die weltliche und geistliche macht des heiligen stuhls. Von Dr. J. F. Neigebaur. Leipzig, 1847. 1 vol., 8vo. pp. 410; paper.

—Schwede in Jahren 1843. Von Theodor Mugge. Hanover, 1844. 2 vols., 12mo., pp. 316-255; paper.

—Types de Caracteres Russes. Par M. Ivan Golovine. Paris and Leipzig, 1847. 2 vols., 12mo., pp. 264-252; paper.

—Polen unter Russischer herrschaft, etc. Von C. Goehring. Leipzig, 1843. 3 vols., 12mo., pp. 242, 270, 288; paper.

—Malerische Reise in einigen provinzen des osmanischen reichs aus den polinschen des Herrn Grafen Edward Raczyński übersetzt heraus gegeben von Fr. Heinr. von der Hagen. Breslau, 1858. 1 vol., 8vo. pp. 300; paper.

—Neuestes Gemälde der Königreiche Niederlande und Belgien. Von Dr. Neigebaur Wien, 1834. 1 vol., 8vo. pp. 328; paper.

—La Russie, La Pologne, et La Finlande: Tableau statistique, géographique, et historique. Par M. J. H. Schnitzlers. Paris. 1 vol., 8vo., pp. 74; paper.

UNITED STATES AND CANADA—(*Presented by Frank Moore, Esq., Treasurer of the Am. Geo. and Stat. Society.*)

—The United States and Canada in 1832, '33, '34. By C. D. Arfwedsen, Esq. London, 1834. Bentley. 2 vols., 8vo. pp. 435, 418; bound.

—America and her Resources. By John Busted. London. Colburn & Co., 1818. 1 vol. 8vo. pp. 540; bound.

—A Statistical, Political and Historical account

of the United States of North America. By D. B. Warden. Edinburgh. Constable & Co., 1819. 3 vols., 8vo., pp. 522, 571, 588; bound.

COOK'S VOYAGES—(*Presented by the same.*)

—A Voyage towards the South Pole and around the World in 1772, '73, '74 and '75. By Captain James Cook. London. Strahan, 1777. 2 vols, 4to., pp. 378, 396; bound

BOOKS, ETC., ADDED BY PURCHASE.

Massachusetts State Record. 5 vols., 12mo.

Porter's Progress of Nations. 3 vols., 12mo.

Manual of the Common Council, 1850-7. 7 vols., 12mo.

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DeBow's Review. Vols. 1, 3, 4, 5, 6, 7, 8 and 10. 8 vols., 8vo.

Simmons' Colonial Magazine. 11 vols., 8vo.

Fisher's National Magazine. 3 vols., 8vo.

American Annual Register. 7 vols., 8vo.

Transactions of Am. Antiq. Soc. 2 vols., 8vo.

American Railroad Journal, 1848 to 1858. 10 vols., 4to.

Hazard's U. S. Commercial and Statistical Register. 5 vols., 8vo.

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Thom's Statistics of Ireland. 1 vol., 8vo.

Conseils Generaux de l'Agriculture. 3 vols., 4to.

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Commerce and Navigation Tables, 1821 to 1841. 21 vols., 8vo.

Macgregor's Commercial Statistics. 5 vols., 8vo.

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Index to Archeologia. 1 vol., 4to.

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Burton's El Medinal, etc. 1 vol., 12mo.

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Gibson's Kansas. 1 vol., 12mo.

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Transactions of the Royal Geographical Society of London. 10 vols., 8vo.

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Bingham's Sandwich Islands. 1 vol., 8vo.

Johnson's California and Oregon. 1 vol., 12mo.

Western Address Directory, 1837. 1 vol., 12mo.

Methodist Episcopal Register, 1852. 1 vol., 12mo.

Birbeck's Letters from Illinois, 1818.

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PROCEEDINGS.

TENTH MEETING, June 2d, 1859. In the absence of the President, the Rev. Joseph P. Thompson, D. D., 3rd Vice President, took the chair.

On motion, the ordinary business of the Society, except the admission of new members, was suspended.

Herman Andersen, Samuel Dexter Bradford, Jr., Julius Bing, Malcolm Campbell, Robert J. Dodge, John S. Dunning, Daniel W. Fiske, James Lorimer Graham, Jr., Andrew F. Higgins, Henry B. Millard, William C. Miller, ——— Nugent, Bartholomew O'Connor, Edward P. Rudd, James M. Sanderson, Charles Tracy, J. Howard Wainwright, and Alexander R. Walsh, were elected Resident Members.

Thomas Hoynes, of Chicago, Ill., and Thaddeus Stevens, of Lancaster, Pa., were elected Non-Resident Members.

The Chair then stated that the particular object of the meeting was to enable the Society to pay a tribute of respect to their lately deceased Honorary Member, Alexander von Humboldt.*

Prof. Francis Lieber, L. L. D., then read a paper on "The Life and Character of Humboldt."

Resolutions, expressive of the Society's re-

* A full report of the proceedings of this meeting, with the several addresses, etc., will be issued in a separate form.

gret at their great loss, were introduced by the Honorable Charles P. Daly, and, having been seconded by Professor Alexander Dallas Bache, L. L. D., in an eloquent and feeling address, unanimously carried.

Remarks were also made by Professor Arnold Guyot, and the Hon. George Bancroft.

Adjourned.

DEPARTMENT OF GEOGRAPHY.

NOTES ON SIAM.*

BY DAVID OLYPHANT KING, ESQ., OF NEWPORT, R. I.
Accompanying a Map of His Travels.

Having been the first to avail of the recent opening of the Kingdom of Siam, circumstances obliged me to be often absent from the capital city, and I beg to hand you herewith a copy of the map of my travels in that country and the adjacent Kingdom of Cambodia, sufficiently interesting, I trust, to warrant its reception at your hands.

With the exception of M. de Pallegoix's account of these countries, nothing has hitherto been published respecting them worthy of any confidence; and of the interior, beyond the city of Bangkok, the fanciful accounts of the natives served merely to excite a curiosity that

* A letter dated Newport, R. I., Feb. 5, 1859, read before the "American Geographical and Statistical Society" on Thursday, 24th March, 1859, by John Jay, Esq., Foreign Corresponding Secretary. (*See Proceedings*, p. 65.)

a foreigner was unable to gratify. Permitted at last to investigate for ourselves, I became acquainted with Eastern Siam, and what is left of the old Kingdom of Cambodia; and although the many reported marvels in botany and natural history were successively followed up until they were proved fables, still the geographical features of a new country are always of interest, and a few general remarks respecting them may not be unacceptable.

The eastern shore of the Gulf of Siam stretches from Bangkok to Chantiboon, and beyond Kampoot, but the lofty range of mountains along the coast impedes communication, and the Petrio canal is exclusively used by travelers to or from the eastern provinces. This canal, fifty-five miles long, connects the city of Bangkok with the Bang Pa Kong river, and is made through a flat alluvial country, entirely devoted to the culture of rice. The natives, like the rest of the Siamese, appear to be a branch of the Malay family. The floors of their bamboo thatched houses are raised some four feet from the ground, their clothing simply a cloth round the waist, and whatever they may be engaged in, one hand is generally actively employed warring against the swarms of mosquitos.

The canal joins the Bang Pa Kong River twenty miles from the mouth of the latter. This river, as you ascend, becomes narrow and winding; cultivation is restricted to a strip of land on either bank at first, and then occurs only at intervals; the inhabitants are few and poor, and nothing that can be called a village is met with until you arrive at Pachim. Here, and elsewhere in Siam, the traveller is struck by the immense tracts of land laying idle for the want of a laboring population. Emigration from China would soon remedy the evil, but the Siamese rulers dread the introduction of any number of coolies, and restrict their importation.

Pachim is the residence of the governor of a province, and the traveler must land and show his passport. The officials are invariably civil and obliging, provided your passport comes

from their superior in rank; and custom among themselves obliges the foreigner to offer a small present before leaving. The town of Pachim consists of some twenty bamboo houses, and was entirely destroyed two years since—a fire from the prairie consuming crops and all. The river here is about forty yards wide, and during the rainy season, from July until November, runs out at the rate of five miles per hour: during the rest of the year there is a regular rise and fall of the tide here, and its influence is felt up to Kabin. Leaving Pachim, the navigation of the river is tedious, being against a strong current in the wet season; after which the river rapidly falls, and the channel is narrow and full of obstructions. An occasional glimpse of the mountains far off to the east and north is obtained, but the country along the river maintains its level character, and generally is densely wooded.

Twenty years ago, during a war with the Cochinchinese, a military road was constructed from the town of Wooang Kabin, at the head of navigation, across to the Tasawai River; and although the bridges have disappeared and the road is a mere wreck, still it is the only route across the country. Merchandise is conveyed in small, but neat, covered carts, drawn by a pair of buffaloes—travelers using elephants; and from this point over to the confines of Cochinchina, these latter animals occupy the place the horse does with us. They are large, docile, and well trained, and cheaper than anywhere else in the world—a full-grown animal being worth from \$50 to \$75. About two-thirds of the males are provided with tusks, and in buying and selling the natives appear to think nothing of the value of the ivory. Ten miles south-east from Kabin, I visited a spot on the bank of the river, where a number of natives were sinking shafts, in search of gold. From all I could learn, but little had ever been found, and of late scarcely any.

Elephant traveling over the military road is tedious and uninteresting. During the rainy season the streams are so swollen that the road is never traversed if it can be avoided, and the

want of water in the dry season is an ever present evil; the elephants soon become foot-sore and sick, if pushed beyond twenty-five miles per day; travelers are rarely met with, and solitary houses, twenty miles apart, only relieve the weariness of the route. One day out from Kabin the road winds around the base of a mountain, but with this exception, it is all a prairie across to Tasawai, occasionally broken and rolling, and then stretching for miles as smooth as a floor. The soil is of red sand, and the trees twisted and dwarfed in a manner I could never account for, until, caught upon one occasion by the fire that annually sweeps over these plains among them, I had an opportunity of seeing how the young trees were parched and shriveled by it. Bog iron, which occurs frequently, is the only metal to be found on the road.

The provincial town of Mattabong is situated on both sides of a river of that name, in the center of an immense plain. The country, for nearly a hundred miles around it, is flooded with water soon after the commencement of the rains, traveling becomes impossible except in boats, and wild animals wander off to the mountains. The existence of a large lake to the eastward has been reported to foreigners ever since their residence in Siam, and in the map accompanying M. de Pallegoix's work, it is incorrectly inserted. The native accounts of its size were found to be not far from the truth, and I passed completely round it, the shores everywhere being pleasantly diversified with forest and open prairie. The natives hold the lake in a sort of superstitious fear, its rough waves causing many accidents to their small canoes; and squalls and water-spouts are of frequent occurrence. During the months of January, February and March, when the water has drained off the surrounding country, the lake appears alive with fish, and the inhabitants collect large quantities of them. From September to December, the banks are overflowed from ten to twenty feet deep; in the lake, no bottom at ten fathoms; at the close of the dry season, in May, frequent shoals occur in its

bed, and a boat drawing two feet of water is all its shallowness will allow.

At the northern extremity of the lake, in the vicinity of Simrap, was situated the ancient capital of Cambodia, no trace of which now remains except in the Nokon Temple, spared from destruction on account of its religious character, when the city was taken by the Cochin-Chinese, about A. D. 200. The temple stands alone in the jungle, in too perfect order to be called a ruin—a relic of a race far ahead of the present in all the arts and sciences. A magnificent stone causeway, a third of a mile long, leads through an ornamental entrance up to the temple, composed of three quadrangles, one within, and raised above the other. The lower quadrangle is 200 yards square, a broad verandah, with a double row of square ornamented pillars running all round, with large and elaborately ornamented entrances at the corners and centers. It is built of hard grey sandstone, without wood, cement or iron in its composition, the blocks of stone fitting to each other with wonderful precision, and the whole temple, within and without, covered with carefully executed bas-reliefs of Buddhist idols. A few priests reside outside its walls, and the place is visited as a shrine by the Cambodians. On the eastern verandah, a square tablet of black marble has been set into the wall, covered with writing, and doubtless setting forth the main facts in the raising of the temple. The characters used are precisely similar to the present Cambodian alphabet, but so much has the use of the letters changed, that the present race cannot decipher it.

The Oodoong River issues from the the south end of Smith's Lake, and is throughout a broad, majestic stream. The town of Poontenang supplies the whole country with pottery, and from there to Oodoong scarcely a sign of human life is to be found. This city (Oodoong) is the present capital of Cambodia—the former city having been completely destroyed by the Cochin-Chinese, fifteen years ago. A wooden palisade, twenty feet high and 600 yards square, encloses a straggling collection of

thatched houses, the residences of the nobles, in the centre of which a low brick wall encloses the palace, mint and arsenal. Everything bespeaks poverty, and the recent ravages of war; but nothing could exceed the friendliness of the welcome extended to us by the King, and we were assured that foreign travelers would be willingly granted every facility.

On the river below Oodoong, the Roman Catholics have a mission establishment, at Pena Loo, where we found a bishop and one priest, and descending the river, stopped at Pelompeng, a town on the borders of Cochin-China. This is a place of some little trade—raw silk, iron, dried fish, &c., being brought here from the Cambodia River—but the crowds of Cochin-Chinese in the streets manifest anything but kind feelings. From a hill in the rear of the town, the further course of the rivers, as shown in my map, was noted; the Cambodia River, after receiving the Oodoong River, turning due east, with a breadth not less than two miles.

The elephant road from Oodong to Mattabong, like the rest of the roads, is only available during the dry season, and as far as Potisat, winds through a hilly region. Near this town a large deposit of antimony is found, and also quarries of Oriental alabaster. The journey from Mattabong to the coast at Chantiboon usually occupies six days, the crossing of the coast range of mountains causing some delay, and affording nothing in scenery in return.

The botany and natural history of this region, so far as I can judge, afford nothing new or strange. The annual overflow of the plains is favorable to nothing except aquatic plants, and the water lily is common everywhere. In addition to white and purple lilies, and the common lotus, a bright cherry colored variety is found at Simrap. At Penit Pza, a lily was said to exist, surpassing in size and beauty the Victoria Regia. It was not in flower at the time of my visit, and the leaf of the plant was similar to the lotus. The cork tree, wild nutmeg, licorice, and several varieties of india rubber and gutta-percha, are met with in the mountains, but not in sufficient quantities to

be of commercial value. My endeavors to meet with the tree producing the gamboge gum were unsuccessful, it only being found in the mountainous region between Chantiboon and Kam-poot.

The wild animals of the country are not as numerous as might be supposed. The natives say that twenty years ago an epidemic swept off immense numbers of them; and though tracks of deer, buffalo, wild cattle and pigs, are often seen, the animals are few and wild, and seldom met with. Wild elephants and rhinoceri are found in remote districts, and the tiger and leopard are heard of occasionally everywhere. The natives hold these last in but little fear, saying they have never been known to attack any one that faced them. This country has long enjoyed a reputation for abounding in reptiles that does not belong to it. The skins of anacondas offered at Bangkok come from the northern provinces, and in all my travels I never saw but four snakes, all small. The annoyances of travel are caused by smaller specimens of animal life. Ticks are common, and require constant care; mosquitos are often very troublesome; and swarms of large horse-flies, that bring blood through an elephant's skin, sometimes drive men and animals almost wild; but the greatest nuisance are the ground leeches. The first shower of the rainy season brings into life a crop of leeches, that grow to some three inches long, and infest the face of the earth. Warned, by the rustle of the leaves or the jar of the ground, of the approach of something living, they erect themselves on one extremity in the pathway, and swing round and round, trying to cling to what is passing by. Halt in the path, and you can see them coming in hurried spans from all sides; drive your pantaloons inside your boots, and they climb up and get down your neck. To sleep in the open air is impossible, as they rest not at night, and animals of all sorts are covered with them.

The birds of the country are mostly of the wading species. Pelicans and ducks are common, but the adjutants and birds of the crane

family are innumerable; eagles and vultures are commonly found in the vicinity of carrion, and the shoe-horn bird of Sumatra is occasionally met with in the forest.

So far as my experience goes, this land is poor in minerals. A little gold is obtained, but iron is the only thing found in any quantity; no trace of coal anywhere. The mountainous region along the coast is doubtless richer, but is at present unknown.

With these remarks, I commend the accompanying map to your attention.

REMARKS OF THE HON. CHARLES P. DALY.

Judge Daly said that the acknowledgments of the Society were due to Mr. King for the interesting paper he had forwarded. Traveling through a country as yet but imperfectly known, he had been careful to observe those things which travelers generally neglect, and as careful to omit what they usually thought it important to relate. He has carefully observed the natural features of the country over which he passed—the soil, its capacity for cultivation; the means of irrigation, and the industrial state and condition of the inhabitants; the winding and course of the roads; the width, direction and strength of the current of rivers; the probable limit and nature of the mineral deposits; the flora, and fauna, correcting our impressions both as to the numbers and variety of the former, and removing the prevalent impression that the country east of the Menam abounded in reptiles. This indeed is what such a communication should be—a contribution to our knowledge of geography.

In respect to the temple described by Mr. King, it is to be inferred from its locality and structure that it belonged to a later period than that which produced those stupendous works, the excavated rock-temples, grottos and pagodas, which are found at Elephanta and Salsette in Bombay, at Ellora and Deoghur, along the Coromandel coast from its northern to its southern extremity, and in the island of Ceylon. In some respects the temple resembles the great pagoda at Seringham, situated

near the southern extremity of the Indian peninsula, and that on the island of Ramisseram, between the peninsula and Ceylon—the former of which is a seven-fold inclosure, or court-within-court, rising like this temple pyramidally; and the latter has similar to this, a grand entrance leading up to the principal temple. As the worship of Brahma is said to have been brought from Ceylon to the Malayan peninsula and the adjacent islands, the religious architecture connected with that worship would naturally follow; but it is observable that in that great group of architectural remains, the chief seat of which is the island of Java, and to which this temple from its proximity must be regarded as belonging, a far greater perfection in art is exhibited than in Ceylon or in the Indian peninsula, especially in the use of the arch. It is here that those quadrangular enclosures, rising one above the other as in the temple seen by Mr. King, constitute the prevailing style. The temple of Boro Budor, in Java, has six of these enclosures, and that of Brambanan, in the center of the island, consists of five parallelograms one within the other, embracing on the whole nearly three hundred temples or chapels. In the island of Madura near Java, there is one of those pyramidal pagodas, surrounded by ornamental pillars like the temple in Cambodia. All the chief features of this temple, as described by Mr. King—its series of quadrangular enclosures, rows of ornamented pillars and verandahs, its blocks of stone fitting so exactly, its highly ornamented entrance, its walls covered with figures carefully executed in bas-relief; its inscribed tablet set in the walls—denote that it belongs to that period of advanced civilization and development of which we know so little, but the evidence of which appears in the extraordinary architectural remains existing, especially in Java. A comparison of the description and drawing of the temple to be found in Sir Stamford Raffles work on Java, and that of other writers on the Indian Archipelago, would seem to warrant this conclusion. It might be expected that a temple found in this locality would possess the

general features of those in the neighboring kingdom of Burmah, which date from about the eleventh century; but the Burmese architecture—judging from the drawings and description of Mr. Yule in his recent work on Ava, especially of the extensive mines which he found at Pagan—is different, abounding largely in the use of the arch, and, very strangely in that quarter of the world, combining much of the Saracenic with the general ground plan of the cruciform gothic. It was to be regretted that Mr. King had not copied the inscribed tablet he saw set in the wall of the temple. Similar inscriptions from Java had been preserved by Raffles, and would be found carefully engraved in his work. The attention of scholars was now actively turned to the languages of the Indian Archipelago, and every inscription of a character like this would be useful. Mr. King, on the authority of the present ruler of Cambodia, considers this temple as dating back to the second century. This is a period much earlier than has generally been assigned to the large and elaborate religious structures of the Indian Archipelago. The period of their erection is usually fixed between the sixth and ninth centuries; but our knowledge upon the subject is very imperfect, and archeologists are scarcely in a position to dispute the point with his majesty, the King of Cambodia.

Judge Daly then referred to the importance of the recent relations established between the United States and Siam, and what might be expected to grow out of it. The public interest had been chiefly attracted by the opening of Japan through the efforts of our government, and great anticipations had been formed of the important consequences that would result from it. It might be doubted, however, at least in a commercial point of view, if more solid advantages would not accrue to the Union from the change in the restrictive policy that had hitherto closed Siam against all intercourse with the maritime nations of the world, than would result from the expedition to Japan. The opening of Japan had exhibited a state of things very different from what might have

been expected from the course pursued by that remarkable people, in having no communication with Europe or America, except through the channel of one nation, and that of the most limited and restricted kind. We had found them in a high state of material prosperity, polite, industrious, temperate, exceedingly intelligent, and exhibiting all the marks of an orderly and well governed people. If they had not reached the perfection in the arts, sciences, and general knowledge to which the western nations have attained, they did not at least present those extremes of social condition—the poverty, misery, pauperism, and vices inseparably linked with, and which stand in such fearful contrast with our highest form of modern civilization. Our consul, Mr. Harris, had declared in a recent communication that in no country in the world was there so little poverty; none where the mass of the people enjoyed more solid and substantial comforts with less of harrassing and debilitating labor; and the picture of national prosperity and happiness was so striking as to draw from him a very fervent hope that his coming among them might not be referred to hereafter as marking the period when a change for the worse took place in their national condition. It was a grave question whether a people so situated would be benefited or injured by closer contact with the maritime nations of the world, and whether the production of the country would be more than adequate for the wants of a population so numerous, and who would have but little to offer in exchange. Commerce, it was true, created artificial wants, but it was to be remembered that the Japanese were not an indolent people in possession of a fruitful country, who might be stimulated by commerce to greater exertion, but a very numerous, thriving and industrious people, generally estimated at over fifty millions, who had hitherto consumed nearly all which they produced. In the commerce they had maintained with the Chinese and Dutch, they had little to offer except camphor, copper ingots, silk fabrics, lacquered ware, and porcelain, in exchange for

dyes, spices, sugars, sperm oil, cotton and linen cloths, and a few of the metals; and even this trade was very limited.

Siam presented a marked contrast to this condition. It was a tropical country, abounding in nearly all the valuable productions of the east, and, with an industrious population, could furnish vast quantities for export. It was especially rich in spices, gums, in the costly woods and other articles so highly valued in commerce; and for the great staples which support a population, such as rice, it was one of the most productive countries in the world. But whilst thus highly favored by nature, it was inhabited by a people who, though temperate, reverential, and even gentle, were, by the common agreement of all travelers, crafty, mean, ignorant, lying, conceited, slavishly servile, and universally indolent. Though much larger than the three islands of Japan proper, and with a soil capable of yielding much more abundantly, its population was not more than one-tenth of that of Japan. Here was a field for civilization and its fruits. Three American missionaries have been established for some years at the capital, Bangkok; and though their mission has not been crowned with much success—for it was believed that they had not made one Siamese convert to Christianity—still these gentlemen had done a great deal for mankind by enlightening and enlarging the views of the present ruler of Siam, his prime minister, and several influential members of the government; and it was undoubtedly to their labors chiefly that we are indebted for the change in the restrictive policy of the government, and the success of the mission of Sir John Bowring and our commissioner, Mr. Harris. The King of Siam had acquired a knowledge of the English language, and for an Asiatic monarch he spoke and wrote it with tolerable proficiency. His brother had given much attention to the study of medicine, and had recently been elected a member of the Medical Society of this city—an honor he valued very highly. The government had evinced great interest in this country, and it

was for us to keep up and strengthen that feeling. The present was but the beginning of a commercial intercourse that might be greatly enlarged hereafter, especially with the extension and development of our own empire on the Pacific. It was well, therefore, that the attention of our people should be drawn to this important country; that our merchants, especially, should turn their eyes in that direction, and ascertain what advantages Siam offers for more extended commercial relations. Our merchants would no doubt follow up the pathway that had been opened by our missionaries, and through the stimulating influence of commerce, this rich and fruitful country would be brought to contribute to the productive industry and advancing civilization of the globe.

BRITISH COLUMBIA.

Governor Douglas has issued a proclamation, declaring that a new town, to be the capital of British Columbia, would be laid off on the northern bank of Fraser River. The plans were to be published in March, and one-fourth of the lots reserved for purchasers from the United Kingdom and Canada; the other three-fourths would be sold by auction in April, to the highest bidder. The purchasers of town-lots in Langley who had paid in full, would be permitted to surrender them, and have the purchase-money applied in payment of lots at the new capital.

The proposed capital will be declared to be a port of entry, and vessels will be enabled to proceed direct to Fraser River without, as heretofore, touching at Victoria, or may touch at Victoria at their option.

The new town is to be called Queensborough, and will be at the mouth of Pitt River, five miles from the mouth of Fraser, and fourteen miles below Langley.

In the same proclamation, announcing his intention to found a new capital, Governor Douglas has issued some regulations about the lands and mines of the Colony. He declares that all the lands and mines belong to the Crown in fee; that the lowest price of the

land shall be \$2 50 per acre, and that all the land except such as may be specially reserved shall be sold, but that the ownership of mines of gold and silver shall still remain with the government.

EXPLORATIONS AND SURVEYS.

Orders have been issued by General Harney, commanding in Oregon, directing four companies to open a wagon-road between the Columbia and Great Salt Lake City. The expedition is to be commanded by Capt. Wallen, 1st Lieutenants Bonnycastle, Johnson and Sweetzer, and 2d Lieutenants Reno, Houston, Roberts and Dixon, and Assistant-Surgeon Randolph. The objects of the expedition are stated to be "to increase the facilities of communication between the Columbia River and the Valley of the Great Salt Lake, in connection with the overland route to the frontiers of the Western States, by opening a good wagon road to the Snake River, in the vicinity of the mouth of the Malheur River, and from there to a point called the 'City Rocks,' at the junction of the road from Forts Laramie and Bridger with the road from Fort Hall to Great Salt Lake City."

By the latest advices from Oregon (20th May, 1859), Lieutenant Mullan and his party had arrived at Portland. They would immediately go to work on the survey, and cutting through a wagon-road from Walla-Walla to Fort Benton. By the same mail we learn that the steamer Col. Wright, on her last voyage, ascended the Snake River some 50 miles—that is to the site of Fort Taylor, at the mouth of Tu-keh-non—encountering between the mouth of the Palouse and the Tu-keh-non, a distance of three miles, a very strong rapid. Hereafter, in connection with the movement on Colville, she will make the landing at the mouth of the Palouse, where she will also land the supplies for the Fort Benton road party, whose labors will be greatly facilitated and shortened by this inauguration of steam navigation on the Snake. The Columbia is now regularly navigated by steamers, in all its length below

the Palouse, only requiring transhipment at the Dalles.

In South America, the Frenchman, Dr. Plasard, who is settled in Ciudad Bolivar, has undertaken an excursion into the interior of Venezuelan Guayana, and found gold to the south of the lower Orinoco, toward the Yuruari.

At Rio Janeiro, Messrs. Capanema, Lagos and Gonsalvo Diaz are preparing for a second expedition into the interior of Brazil, which is almost entirely unknown, and in the possession of wild Indian tribes. They will have a military escort.

AFRICAN DISCOVERY.

The great center to which most discoverers instinctively turn, is still the interior of Africa. Those vast countries which are represented in blank on our maps, have been attacked from all sides—east, west, north and south.

The renowned Dr. Robert Livingstone is now making an excursion in those countries which he discovered during his long journey from St. Paul de Loanda to Quillimane. He embarked last year, equipped with instruments for making scientific observations. He will first attempt to go up the Zambeze River in a canoe, which he has named "Ma Robert," or Robert's wife or mother, as the natives along the Zambeze River have great respect for the wife and mother of a man whom they admire.

The English steamer, the *Rainbow*, sailed on the 6th January out of Bonny into the Gulf of Benin, to explore the country along the Niger.

Ladislaus Magyar of Theresiopol, in Hungary, who, after the Hungarian insurrection, became a citizen of Brazil, has hit upon a rather singular but very prudent way to penetrate into the mysteries of inner Africa with the greatest possible safety and advantage. He has just married the daughter of the black King of Bihe in Upper Guinea. He has become Commander-in-Chief of the armies of his father-in-law, and uses his authority and his soldiers

to become acquainted with the countries lying in his neighborhood.

Jules Braouerec, commander of the corvette *Oise*, is now exploring the wholly unknown country through which the Gaboon River has its course.

The Swedish discoverer, Anderson, has traveled Ovampo, on the West Coast of Africa, south of Benguela, in the direction of the Cuenene River.

On the east and south coast of Africa, two English officers, Capt. Burton and Lieut. Speke, found and measured last summer the great Lake Uiyi, between 3 deg. 30 min. and 8 deg. 40 min. south latitude—not to be confounded with Lakes Nyassa and Ukerewe, so much talked of in late years. Until this discovery, there was ground for belief in a great central sea in Africa, stretching from 12 deg. south latitude to the equator; but this discovery is conclusive that the great bodies of water which have hitherto been discovered at widely distant points are separate lakes.

The French missionary, Leo des Avanchers, is traveling through the country, which lies to the eastward of this great sea. The German traveler, Albert Roscher, has gone in the same direction, having left Zanzibar with the hope of penetrating far into the interior.

Pedro de Gamitto, Governor of the Portuguese forts Tete and Sena on the Zambeze, is making preparations for new explorations in Central Africa, of which he has already given such interesting descriptions in his book titled "*Muata Cazembe*."

Massaga, the Sardinian missionary, is now exploring the interior of Abyssinia; so also is Bayssiere.

The Upper Nile is the object of untiring exploration. It would be strange if, before the end of this century, its whole course were not as well known as is now that of the Thames, the Seine or the Rhine. While the ægyptologists and archæologists like Mariette, Deveria, Pommereuil, de Seibly, Brugsch, Eckhold and others are searching out the mysteries of Ancient Egypt far up into Nubia, scientific men

have undertaken, singly or in small numbers, to follow the Nile upward, in spite of all the difficulties which for three thousand years have baffled the bravest explorers. Messrs. Firth and Windham are about starting to go up the White Nile in an iron boat thirty-six feet long, drawing but one foot of water. They will be accompanied or followed by Messrs. Thomas-sy, Miani and others.

On the 27th of February last, the Sardinian traveler, Brun-Rollet, died at Khartoum, on the boundary between Nubia and Abyssinia. He had penetrated all the country bordering on the upper Nile, and discovered Lake No, in lat. 12 deg., and the Bahr Keilak, or Misselad, which belongs to the western basin of the Nile.

McCarthy, the son of the geographer, has it in contemplation to travel on a new track to Timbuctoo from Algiers, where he has lived these eight years. According to his plan, he will pass through Laghouat and Goleah, then make a circuit to the east to get out of the way of a tribe of Arabs who have been beguiled by a new prophet, and then continue his journey by Ghadames, Ghat and Lake Tsad.

Other travelers, also, such as Capt. Magnan, Baron Kraft, and Yussufben Gallabi, are bent on discovery, starting from Algiers or other northern points.

ASIATIC RESEARCH.

Asia is also attracting attention and being explored by many travelers. Kriel has been sent by the Vienna Academy into Asiatic Turkey. Rey is exploring some hitherto neglected portions of Syria and Palestine. The brothers Schluginweit are still continuing their researches in Central Asia. A Russian scientific expedition is engaged in the exploration of Chorassan; while a detachment of the French troops in Indo-China is escorting a scientific corps through that country. Many other savans have received missions from the Ministry of Public Instruction, or from the Paris Museum. Beside this, the Catholic and Protestant missionaries are coming more and more

to consider it a part of their duty to send home precise and comprehensive ethnographic and and geographic intelligence of the countries through which they travel.

CONNECTION OF THE NORTHMEN WITH THE EAST.

Communicated by PROF. CHARLES C. RAFFN, and intended to draw attention to the "ANTIQUITES RUSSSES ET ORIENTALES d'après les monuments historiques des Islandais et de anciens Scandinaves," a work edited by him, and published by the ROYAL SOCIETY OF NORTHERN ANTIQUARIES, (tome I-II, with 23 plates, Copenhagen 1850-1852, in imp. 4to.)

The period when the Northmen wandered from their home in the East to Northern Europe, is removed far back and presents itself in darkness and myths. Future inquiries will perhaps explain how long their forefathers retained their speech and manners in their eastern abode. In this place we would only point out the remarkable fact, that the same age which saw the Northmen discovering and colonizing Iceland in the far west, beheld them also reappearing in the East, and with extraordinary energy. Summoned thither from the Scandinavian North, Nestor assures us that, under the name of Variago-Russians, they established the Russian empire in 862, and for more than a century exercised great influence over its affairs, both internal and external. The correctness of this statement by the Slavonic chronicler, and the important part played by the Scandinavian Russians in the first period of that power, becomes evident at once from the names borne by the historical actors themselves, almost all of which belong to the Old-Danish or Old-Northern language, and are recognized in the Northern Sagas and Runographic monuments. They are easily known, in spite of their being corrupted by the spelling of the Slavonic writer: Rurik, Sineus and Truvor (Rørik, Sune, Thurvard); Oskold, Dir (Hoskuld, Dyri); Igor, Oleg, Olga (Ingvar, Høelge, Høelga). The men "of the Russian nation" sent by Oleg in 907 and 911 as ambassadors to Constantinople, all were North-

men: Karl, Frialaf, Vermund, Rolf, Steinmod, Ingjald, Gauti, Roald, Kar, Freyleif, Roar, Eythiof, Thrain, Leidolf, Vestar. In Igor's great embassy of more than 50 persons, who in 944 concluded the important treaty with the Greek Emperors, Karamsin has only found three Slavic names. The rest are Northern, such as: Ivar, Vigfast, Eylif, Leifr, Grim, Kar, Kolskegg, Kol, Hallvard, Frode, Audun, Adolf, Ulf, Gamle, Bursteinn, Asbrand.

The names given by Byzantine authors to the vessels of the Russians, *skedia*, *karabion*, *askos*, will be found among the Skaldic names of ships in the Snorra-Edda: *skeid*, *karfi*, *askr*. In his book on the government of the empire composed in 949, the Emperor Constantine Porphyrogenneta mentions the principal waterfalls or fosses in the Dnieper passed by the Russians in their expeditions to Constantinople. He names them both in Russian (*roosisti*) and in Slavic (*sklabinisti*), and adds their signification in Greek. The Russian names, as has already been shown by preceding authors, are pure Old-Northern: *Essoupe* (*ei sofa*) i. e., not to sleep; *Oulborsi* (*holmfors*), the holmfoss, *Gelandri* (*giallandi*), the yelling; *Aeiphar* (*afr*, vehement), the wasting; *Barouphoros* (*barufors*), slav. *vulnprag*, the billowfoss; *Leanti* (*hlacandi*, the laughing, or *loandi*, the soil washing); *Strouboun* (*strengbuna* or *strandbuna*), the little foss. Liutprand, bishop of Cremona, who visited Constantinople in 946 and 968, expressly asserts that the people whom the Greeks called Russians (*Roos*), were the same nation as those named Northmen by the Frankish authors. These Northmen (Danes, Swedes, Norwegians and some English) flocked, usually by land through the Russian territory, and took service under the name of Verings (*Barangoi*) in the Imperial guard.

A remarkable confirmation of the statement made by Nestor would be afforded, if we could as is probable, venture to assume that the Igvar occurring on several Swedish Runic stones is the Russian grand-prince Igor. Sixty Runic monuments have been carefully examined and copied for this work, many of them by per-

sons specially employed by the Society for this purpose; twelve of these inscriptions speak of an Igvar, and are carved in memory of men who had taken part in his expedition (*i faru med Igvari*), some of them as ship-commanders.

The work, to which Icelandic, Norwegian, Swedish and Danish scholars have contributed valuable papers, commences with extracts from the Eddas and the mythic-historical Sagas, among which the whole of the remarkable *Sogubrot* or Saga-fragment on the old Kings of Denmark and Sweden, and the whole of the charming and important *Hervarar Saga*. Next follow numerous extracts from the Old-Northern historical Sagas. The Northmen made frequent voyages to Gandvik (the White Sea) and Biarmaland, and over the Baltic to Austrveg. The history of the Kings of Norway in the 10th and 11th centuries touches that of Gardarike or Russia in numberless instances. Olaf Tryggvason passed his youth there. The Norwegian prince Eymund repaired thither in 1015, and took part in the feuds between Iaroslav, Burislav and Vartislav; the whole of one Saga is devoted to this Eymund. Saint Olaf was intimately connected with the Russian court, and his son Magnus the Good, afterwards King of Norway and Denmark, spent there a good part of his youth. Together with Rognvald Brusason, at a later period Earl of the Orkneys, Harald Hardrade was long the Lord of the marches to the grand-prince, and Harald himself was afterwards Chieftain of the Vering-guard in Miklagard (Constantinople). The *Færeyinga Saga* speaks of Rafn called Holmgardsfare on account of his voyages to Novgorod, and mentions the Færingman Sigmund's expedition to Gardarike. The lives of native Icelanders contain numerous similar accounts; thus Egil's Saga tells us of Egil's and Thorolf's exploits in Courland, and Nial's Saga has preserved the details of Gunnar's and Kolskegg's attack on Reval and Eysysla. In 1009 Biorn Arngeirson heroically distinguished himself in the service of Vladimir the Great. Another still more famous Icelandic bard and hero, Thormod Kolbrunarskald, after living

several years in Greenland, betook himself to Norway in company with another native American, Skuf, owner of Stokkanes at Eriksfiord and probably kin with the celebrated Gudrid, wife of Thorfinn Karlsefne; in 1029 both followed Saint Olaf to Gardarike.

The attention of English readers is directed to an Old-English or Anglo-Saxon document, the voyages of the Northmen Ohthere and Wulfstan in the North of Europe as related by King Alfred. This paper, with its numerous illustrative notes, is communicated by P. A. Munch. An accompanying facsimile of the MS. in the British Museum has been kindly forwarded by Sir Henry Ellis.

As an illustration to the ancient Icelandic Geographical Monuments, a Mappemonde from the 12th century and three Planispheres from the 13th and 14th have been appended. These are remarkable for having the same orientation as those of the Arabian cartographers in the middle ages—they have the south at the top. Among the geographical annotations for which we are indebted to the abbot Nicolas of Thingeyrar in the north of Iceland, is a journey to the Holy Land in 1151–1153, containing interesting notices for comparison with other voyages to the East at the same period; among them is an Arabic appellation not found in other European voyagers of the same date. To this division also belongs a plan or ichnography of Jerusalem.

THE MAELSTROM.

The very existence of the maelstrom off the Norwegian coast has of late years been questioned, and the ancient accounts of its terrible power been considered as doubtful. M. Hagerup, Minister of Marine, however, has recently given a valuable account of it, and set at rest the merits of the question in favor of its existence and very dangerous character. The vast whirl is caused by the setting in and out of the tides between the islands of Mosken and Lofoden, and is most violent half tide between ebb and flood. At the highest and lowest points of the waters it disappears for about half an

hour, but recommences its whirl with the moving of the waters. In calm weather large vessels may pass over it in safety; but in storms it is perilous to the largest craft. Small boats are endangered in any weather at the time of its strongest action. The whirls, however, do not, as was once supposed, draw vessels under the water, but by their violence fill them with water, or dash them upon the neighboring shoals. In winter, says M. Hagerup, it not unfrequently happens that at sea a bank of clouds shows a west storm, with heavy surf, to be prevailing there, while further in on the coast the clear air shows that on the inside of the West-tjörd (east side of Lofoden) the wind blows from the land, and sets out through the tjörd from the east. In such cases especially an approach to the maelstrom is in the highest degree dangerous, for the stream and under-current from opposite directions work there together to make the whole passage one single boiling cauldron. At such times appear the mighty whirls which have given it the name of maelstrom (that is, the whirling or grinding stream), and in which no craft whatever can hold its course. The writer considers that it is quite impossible for even a steamer to force its passage during a winter storm, and unadvisable, under any circumstances, for a sailing vessel to undertake the risk. In the most propitious season a sailing vessel might encounter a calm or a light wind, whereby the power of the stream would become greater than that of the wind, leaving the vessel no longer under command, and on a dangerous coast.

QUICKSILVER IN CALIFORNIA.

A rich quicksilver mine, called the Lawrence, has been discovered on the Fossatt claim, a mile and a half from the New-Almaden mine. Sixty men were employed (June 23) in putting up buildings for dwellings, smelting-houses, etc. The discoverer says that next to New Almaden, it is the richest quicksilver mine in the State. The New-Almaden, the Lawrence, the Guadalupe and the New-Idrin are the only quicksilver mines in California now worked.

The quantity exported in 1853 was 18,800 flasks; in 1854, 20,963; in 1855, 25,968; in 1856, 23,924; in 1857, 27,262; and in 1858, 26,212 flasks. The flask averages 75 pounds avoirdupois. The quantity retained in the State for domestic operations must also be large.

POSITIONS ON LA PLATA.

(From Page's *La Plata*, etc.)

Places.	Lat. South.	Long. West.	Altitude of the river.
Montevideo...	34° 54' 08"	56° 13' 00"	...
Higueritas...	34° 52' 25"	58° 25' 55"	...
Buenos Ayres...	34° 36' 14"	58° 33' 00"	...
Colonia.....	34° 28' 15"	57° 52' 00"	...
San Isidro....	34° 28' 00"	58° 30' 45"	...
Martin Garcia...	34° 10' 53.7"	58° 16' 28.6"	...
Rio Negro(<i>mo</i>)...	33° 21' 33"	58° 25' 37"	...
Paysandu ...	33° 18' 24"	58° 07' 28"	...
Frey Bentos...	33° 07' 13"	58° 20' 25"	...
Concepcion del Uruguay...	32° 29' 32"	58° 14' 55"	...
Salto del Urug...	31° 23' 20"	57° 59' 39"	...
San Pedro (near).....	33° 41' 00"	59° 39' 34"	82
Rosario	32° 56' 44"	60° 30' 04"	100
Las Vacas.....	32° 10' 00"	60° 41' 43"	...
Diamante ...	32° 04' 04"	60° 38' 56"	127
La Paz.....	30° 44' 08"	59° 38' 42"	160
Goya (near)....	29° 07' 00"	59° 21' 20"	...
Bella Vista...	28° 29' 00"	59° 07' 01"	220
Corrientes....	27° 27' 31"	56° 52' 51"	248
Carmen.....	27° 12' 30"	56° 14' 21"	...
San Cosmi....	27° 19' 09"	56° 24' 48"	...
San Rafael....	27° 07' 39"	56° 50' 21"	...
Cerito	27° 17' 32"	58° 39' 52"	...
Santiago	27° 07' 39"	56° 50' 21"	...
Pilar.....	26° 37' 09"	58° 22' 35"	268
Villa Franca...	26° 18' 41"	<i>No observ.</i>	...
Villa Villeta...	25° 29' 29"	57° 37' 42"	...
Asuncion.....	25° 16' 29.7"	57° 42' 42"	*307
Villa Rica....	25° 47' 10"	56° 30' 20"	†...
Concepcion....	23° 23' 56"	57° 30' 59"	330
Salvador.....	22° 48' 45"	57° 52' 12"	333
Pan de Azucar...	21° 25' 10"	57° 58' 54"	‡340
Olimpo (Ft. Bourbon) ..	21° 01' 39"	57° 55' 40"	366
Salinas.....	20° 36' 24"	58° 05' 59"	...
Coimbra	19° 55' 43"	57° 52' 34"	383
Albuquerque...	19° 26' 53"	57° 28' 31"	390
Corumba.....	18° 59' 43"	57° 44' 36"	396

* The city is 63 feet higher than the river.

† An interior town—323 feet above Asuncion.

‡ Summit 1,355 feet.

DEPARTMENT OF STATISTICS.

NEW YORK STATE CENSUS, 1855.*

The completion of the State census of 1855, affords an opportunity for noticing some of the prominent results that may be drawn from its summaries, and comparing these with former enumerations, with the view of illustrating the progress of our development, and the comparative growth of the city and State of New York between different periods.

An equal distribution of representative power can only be ascertained and preserved by careful and repeated summaries of our numbers, and these have become equally necessary in an intelligent administration of public affairs, and the multiplied details of government.

Nor are the fruits of the census less useful to the private than the public interests of society. The merchant, the manufacturer, and the projector of new lines of communication or new schemes of commercial or financial enterprise, not less than the philanthropist, the politician, and the statesman, seek in its columns for the numbers, the character, the origin and the condition of the population embraced within their several fields of operation.

The interest which these enumerations awaken, is not limited to the period that produced them, nor their utility to the illustration of the existing conditions of the country to which they relate. When their occasion for present use has been superseded by newer summaries, they become valuable *landmarks*, by which to measure the progress of the community in numbers and resources; the *data* by which to compute the influences of moral, political and social causes upon the body politic; the *elements* from which the historian derives his facts concerning the upward and progressive, or perchance the declining fortunes of the nation.

Although the occasion of obtaining a census

has been seized as a favorable opportunity for procuring a multitude of facts relating to agriculture, and various statistics of an educational, religious and literary character, still the primary and prominent end of its inquiries is, to develop the individual and social condition of man; to penetrate into his most intimate social relations, and discover the organic elements of the civil economy.

In private life, it takes him at the first day of his existence, adds him to the general number of births, and retains him perhaps three-fourths of a century in its columns. It reckons him a dozen years at school, and perhaps records him among the marriages. It makes him figure in the classification of the varied professions and occupations of life, or assigns him a place among the civil or official stations of the country; or it may be, unfortunately, in the statistics of asylums or prisons; and at length, after figuring many times in the drama of life, it takes a final estimate of him in the column of deaths!

In the course of life, how much of good or evil to the general well-being may have depended upon this unit of the population! At the tribunal, on the jury, at the elections, in the legislative assembly, he may have represented a decision, a verdict, a vote, upon which, perhaps, hung the balance of justice, or the destinies of the State!

His industry or wealth became the source of numbers which expressed agricultural or industrial production, and all the interests which accompany their fortune. If unfortunate, and needing the aid of public charities, the census kindly directed attention to his necessities, and enabled the government to proportion its charities to the demands actually existing upon them.

Although for many centuries, among Egyptians, Greeks and Romans, enumerations, corresponding with our census, were employed to second the wonderful development of civilization and art to which these nations attained, the application of statistics, like that of kindred sciences, was lost during the middle ages.

* * Results of the New York State Census of 1855; and the comparative growth of the City and State of New York between different periods"—a paper read before the American Geographical and Statistical Society, by Franklin B. Hough, Esq., M. D., of Albany, 2d July, 1857.

After the revival of learning, this science long remained purely speculative, and unapplied to public affairs; rejected by the people as a fiscal invention for more thoroughly exhausting their slender resources, or as a contrivance for further facilitating military conscriptions—and shunned by princes, as divulging the secrets of their government, or perhaps betraying their weakness to the calculating and aggressive cupidity of some neighboring rival power.

The want of data for an intelligent administration of the affairs of her American Colonies, led the English Government, at an early period, and from time to time, to direct an enumeration of their inhabitants; and we have, during the last century, a better knowledge of our population than that of England herself during the same period.

The first State Constitution, adopted in 1777, provided for a septennial census of electors, as the basis of representation in the Legislature; and this, with the period changed to ten years, and extended to embrace the total population, has been continued till the present time, affording, it is believed, the first instance in which a regular enumeration, at *fixed intervals*, was ever instituted.

In preparing the Federal Constitution in 1787, a similar provision was inserted; and not until two enumerations had been made by the United States, did Great Britain and France apply the census to their own dominions.*

From 1698 to 1855, there were taken by authority of Government, thirty separate enumerations, of which all but three exhibit more or less detail concerning each county.

For convenience, I will arrange these in groups, and notice the prominent results of the censuses of the English colonial period, those of the Revolution and until the adoption of the Federal Constitution, the several summaries of electors under the first State Constitution, and the various national and State enumerations, with intervals of ten years.

* The census of Great Britain has been published at intervals of ten years, commencing with 1801, and that of France once in five years from the same date.

Under the English government, a census was taken in each of the years 1698, 1703, 1723, 1731, 1737, 1746, 1749, 1756 and 1771. Partial enumerations of 1688, 1712 and 1714, are also preserved. All of these admit of classification into whites and blacks, the latter usually specified as *slaves*, and (excepting the first) into male and female, adults and children. In 1731 and 1737, the numbers of each class under and above the age of ten years were specified, and and after that period, the years 16 and 60 were used to divide the ages of the population.

These censuses, following at intervals of 5, 20, 8, 6, 9, 3, 7 and 15 years, and extending through about three-fourths of a century, indicate an increase of population in the colony from 18,067 to 163,337, and of the city of New from 4,937 to 21,862 souls.

The general results of each were as follows:

1.—*Absolute Population.*

Years.	White.		Black.		Total
	Males.	Females.	Males.	Females.	Pop'n.
1698....	8,143	7,754		2,170	18,067
1703....	9,322	9,085	1,174	1,084	20,665
1723....	17,593	16,810	3,364	2,807	40,564
1731....	24,856	18,205	4,866	2,897	50,824
1737....	25,740	25,756	4,948	3,993	60,437
1746....	26,860	25,622	4,857	4,250	61,589
1749....	32,355	30,401	5,696	4,896	73,348
1756....	43,261	39,981	7,570	5,978	96,790
1771....	73,990	69,484	10,623	9,240	163,337

2.—*Absolute and Annual Increase.*

Years.	Absolute Increase.	Ratio of An. ratio	
		Increase.	of Incr.
1698-1703.....	5 years.	2,598	14.4
1703-'23.....	20 "	19,899	96.3
1723-'31.....	8 "	10,260	25.3
1731-'37.....	6 "	9,613	19.8
1737-'46.....	9 "	1,152	1.9
1746-'49.....	3 "	11,759	19.1
1749-'56.....	7 "	23,442	31.9
1756-'71.....	15 "	66,547	68.8

3.—*Proportion of Colors and Sexes.*

Years.	White.		Black.	
	Male.	Female.	Male.	Female.
1698.....	88.0	51.1	12.0	48.9
1703.....	89.0	50.8	11.0	49.2
1723.....	84.8	51.7	15.2	48.3
1731.....	84.7	53.4	15.3	41.6
1737.....	85.2	50.8	14.8	49.2
1746.....	85.2	51.5	14.8	48.5
1749.....	85.5	51.9	14.5	48.1
1756.....	86.0	52.5	14.0	47.5
1771.....	87.8	51.8	12.2	48.2

A comparison of these numbers will show an excess of males over females, of about 7½ per cent., a feature noticed in all new countries, and of which further remarks will be made.

The relative per centages of whites and blacks were, at the last of these periods, very nearly that of the first, having in the interval deviated but about 3 per cent. By far the greatest positive increase occurred between 1757 and 1771. The reasons assigned by the governor for this growth were, the high price of labor, and abundance and cheapness of land for cultivation, which, by increasing the means of subsistence, afforded strong additional incitements to early marriages. The proportion of the births to the population was said to much exceed that in Europe, and it was computed that the colonies doubled their inhabitants by natural increase in twenty years.

In addition to the causes thus cited, a very prominent source of prosperity was derived from the conquest of Canada in 1760, which, by removing all apprehension of Indian hostilities, allowed the frontiers to expand without obstruction, and induced large immigrations for the settlement of the immense grants of land which were made during this period. Many of these grants were conditioned to their occupation by a certain number of families within a limited term of years, which led to energetic measures for their settlement.

In 1774, it was estimated that the colony of New York embraced a population of 161,098 whites, and 21,149 blacks.

The emergencies of the Revolution led to the ordering of two enumerations of the inhabitants of the several colonies, with the view of ascertaining the quotas of men and means due from each. These were taken in 1776 and 1782, but of neither have we more than fragments.

In 1786, a full census of New York was taken, by virtue of a provision in the Articles of Confederation, which gave a total of 238,897 to the State, and 23,614 to the city of New York. Of these, there were in the State 219,956 whites, and 18,929 slaves.

Under the first State Constitution, a census was taken in each of the years 1790, 1795, 1801, 1807, 1814 and 1821, embracing the several classes of electors. That of 1814 also included

a few statistics of the total population, and that of 1821, the prominent results of agriculture and domestic manufactures. The results of these enumerations, so far as they relate to the whole State, and to the city of New York, were as follows:

1.—*City Electors.*

Years.	Worth £100.	Worth £20 to £100.	Renting Real estate worth 40s. per an.	Total.
1790.....	1,209	1,221	2,661	5,181
1795.....	2,144	10	4,948	7,202
1801.....	2,332	19	5,693	8,088
1807.....	3,000	20	9,334	12,416
1814.....	3,141	17	10,763	13,941
1821.....	3,881	17	12,761	16,659

2.—*State Electors.*

Years.	Worth £100.	Worth £20 to £100.	Renting Real estate worth 40s. per an.	Total.
1790.....	19,369	23,425	14,674	57,606
1795.....	36,338	9,838	22,598	64,017
1801.....	52,058	5,264	28,522	85,907
1807.....	71,159	5,800	44,330	121,289
1814.....	87,491	5,231	59,104	151,846
1821.....	100,490	8,985	93,035	202,510

The Federal Government has furnished us with seven decennial enumerations, beginning with 1790, and under the late and present Constitutions, a census is required to be taken at like intervals, but in years intermediate with the former. We have thus a summary of our population and statistics, at intervals of five years.

Time will not permit me to notice the progressive development of these systems of enumeration from the first of the series, which included but five particulars, down to the one whose results are about being submitted to the public, and whose details extend to several hundred specific points of statistical inquiry.

Like many other departments of human knowledge, that of statistics applied to the population and resources of the country, has not been uniformly progressive, and more than once have inquiries been directed to subjects whose results scarcely admitted of profitable generalization when obtained, and whose places might better have been occupied by other inquiries, more directly related to the existing conditions of society. These imperfections have

suggested their remedy in the next, and thus each succeeding census has been, or should have been, benefitted by the experience of the past.

Such has now been the number and extent of these researches in the several States and cities of the Union, that the united consultation of those who have directed their classification, would probably develop a system as nearly perfect as the nature of our institutions and circumstances will admit.

Absolute precision in a census would require that no changes should occur while the enumeration was being made, or that it should be as nearly instantaneous as possible, that the persons employed upon the task should be equally competent and zealous, with precisely similar views of their duty in all things, and that the people at large be uniformly intelligent with regard to the various subjects embraced in the inquiries, and disposed to render a full and correct account of each.

Until these can be realized, the census, upon some points, and particularly upon industrial statistics—the best that can be obtained differing widely from the truth in individual cases, but again nearly approaching it in the general average, and comparable in the same census between different sections of the country, and with different periods upon the same subjects.

In stating the leading results of the recent census, I propose to trace the actual as well as the relative changes which each subject of inquiry concerning population has undergone since 1790, or since first reported, so far as relates to the State of New York and its metropolis—occasionally comparing the growth of the State with the Union, and the city of New York with other cities.

Total Population.—During 65 years the State of New York has increased ten-fold, and the city twenty-fold upon their numbers at the beginning of the period. In the one case, the movement was from 340,120 to 3,466,212, and as relates to the city, from 31,131 to 620,810.

The numbers upon which this assertion is founded are contained in the following table:

Years.	City.		State.	
	Total No.	Increase.	Total No.	Increase.
1790.....	33,131	.....	340,120	.....
1800.....	60,489	27,358	596,756	246,636
1810.....	96,373	35,889	959,049	372,293
1814.....	95,519	Decr. 854	1,035,910	76,861
1820.....	123,706	28,187	1,372,812	336,902
1825.....	166,086	42,380	1,616,458	243,696
1830.....	197,112	31,026	1,918,608	302,150
1835.....	268,089	70,977	2,174,517	255,909
1840.....	312,210	44,621	2,428,921	254,404
1845.....	371,223	58,513	2,604,495	175,574
1850.....	515,547	144,324	2,097,394	492,899
1855.....	629,810	114,263	3,466,212	368,818

In 1850, the United States had increased about six-fold upon the population of 1790.

In comparing the relative growth of districts whose actual numbers are widely different, there is sometimes a difficulty in clearly comprehending their true relations, from the inequality of the numerals which represent them. To obviate this, I will present a table in which are given the number of inhabitants at each period, as compared to every 1,000 now living. In cases where the intervals between the enumerations were different, the increase is assumed to be uniform between each.

COMPARATIVE GROWTH OF CITIES AND COUNTRIES.

1.—Growth of Countries.

Years.	N. York State.	United States & Wales.	England land.	Scot-land.	Great Britain.	Fr'ce.
1790.....	96	149	.....	.....	.....	.....
1800.....	169	202	.....	.....	.....	.....
1810.....	277	274	536	596	566	818
1814.....	298	312	586	645	603	838
1820.....	394	369	637	688	658	544
1825.....	467	429	684	732	708	869
1830.....	556	489	732	798	758	898
1835.....	627	569	784	840	810	926
1840.....	701	649	836	883	863	947
1845.....	751	765	891	928	905	976
1850.....	860	881	946	973	947	992
1855.....	1,000	1,000	1,000	1,000	1,000	1,000

2.—Growth of Cities.

Years.	New York.	Brooklyn.	Buffalo.	Boston.	Paris.	London.
1790.....	52	10	.....	99	.....	.....
1800.....	96	14	.....	155	.....	.....
1810.....	156	25	.....	210	576	488
1814.....	151	32	.....	233	595	507
1820.....	196	39	28	269	638	536
1825.....	263	57	69	363	711	594
1830.....	328	82	118	382	734	653
1835.....	425	119	265	489	758	706
1840.....	496	176	245	529	883	759
1845.....	589	250	401	712	979	838
1850.....	818	471	589	852	1,090	918
1855.....	1,000	1,000	1,000	1,000	1,000	1,000

These relations are eminently adapted to exhibition by graphic delineation. It is to be remarked, that the increase of population in agricultural districts has a limit which is soon reached, and the surplus of increase by births must seek other pursuits for profitable employment, or new countries if they would cultivate the soil. Several of the interior and western counties of the State increased very rapidly during the first twenty or thirty years of their settlement, but during as many of their later years have shown but little growth. For example: In Tompkins county, to every 1,000 persons now living, there were in 1800, 23; in 1810, 164; in 1819, 311; in 1820, 703; in 1825, 887; in 1830, 994; in 1835, 1,023; in 1840, 1,024; in 1845, 1,024; and in 1850, 1,037. The rapid increase of this county before 1825, and its almost stationary condition since, presents a remarkable contrast with King's County, which has acquired nearly two-thirds of its population within the last ten years!

While agriculture may have its limit for the employment of human labor, manufactures and commerce present a wide and diversified field of enterprise, opening out into a multitude of inviting avenues to wealth and distinction, promising unlimited success as the certain reward of sagacity and application in business, and affording to the multitudes who seek employment in their various departments of industry, a comfortable subsistence, and, to a certain extent, success according to merit.

Wherever natural advantages or artificial lines of communication may render manufactures or commerce profitable, we may expect to find communities whose growth and prosperity are bounded only by the limit which they may themselves assign to their own operations, or the general prosperity of the nation to whose wants they minister.

It is not my purpose to analyze the causes which promote this centralization of our population, or to consider the relative or combined influences of canals, railroads or steam power in producing it.

Neither does it come within my province to

notice the natural advantages which have contributed to make this city the commercial emporium and financial center of the Union.

The extraordinary growth which we have witnessed during the last ten years, and which have raised the population of New York and its immediate dependencies to over a million in number; the influences which its wealth, its institutions, and its press exert upon the nation at large, are but the beginnings of other and still mightier influences, which it is destined to exert upon the fortunes of the general commonwealth.

Classification by Sexes.—Each census of this State, previous to 1855, has shown an excess of males. The national census has uniformly shown more males than females in the general average, and in all of the States with the following exception: in Connecticut, Massachusetts and Rhode Island, the females have uniformly outnumbered the males. In New Hampshire since 1790, in North Carolina since 1820, in Vermont in 1820, in Delaware in 1840, and in the District of Columbia since 1810, the same has been observed.

In general, the excess of males is greatest in newly settled States, where the population is made up of emigrants from older States or foreign countries, among whom the male sex uniformly predominates.*

As emigration ceases, and the surplus of natural increase is forced to seek other quarters, the disproportion of the sexes is reversed, and we find—as in most European countries—in New England, and now in this State, a greater number of females.

It is generally conceded that there are born more males than females. The extent of this difference in our State remains to be ascertained by a careful system of registration of births.

The relative proportion of the sexes is also observed to vary between different ages. Be-

* The census of Wisconsin in 1855 gave a proportion of about 85 females to every 100 males. The general summary of immigrants into the United States during 35½ years preceding Dec. 31, 1855, gave a proportion of 158 males to 100 females.—(*Brownell's Hist. of Immigration*, p. 175.)

fore the age of 15, we have more males. Between 15 and 30 we notice a marked excess of females—doubtless owing to the greater number of young men who seek employment or homes in the West. Above the age of 30, the proportions change within moderate limits, until the age of 70, above which the chance of life appears to be greater with the female. Of 91 persons reported in 1855 as 100 years of age or upwards, 41 were males, and 50 females.

The following table exhibits the number of males and females in the city and State of New York, between different ages, as shown by the census of 1855:

Ages.	City of New York.		State of New York.	
	Males.	Females.	Males.	Females.
Under 1.....	10,776	11,335	51,440	51,082
1 and under 5...	32,824	32,643	186,368	182,729
5 " 10..	30,287	30,001	198,742	195,639
10 " 15..	28,100	28,239	189,293	185,252
15 " 20..	27,038	34,796	170,015	188,927
20 " 25..	32,940	46,021	168,114	195,100
25 " 30..	36,173	41,418	158,547	166,530
30 " 35..	32,362	30,557	140,355	134,234
35 " 40..	21,992	19,923	111,489	103,409
40 " 45..	18,016	16,789	93,297	86,960
45 " 50..	11,018	10,241	72,949	65,453
50 " 60..	13,319	13,973	100,985	95,817
60 " 70..	5,361	7,194	53,825	54,215
70 " 80..	1,534	2,348	22,462	22,555
80 " 90..	345	607	5,919	6,339
90 " 100..	49	89	702	847
100 and over....	...	10	41	50

Ages unknown 1,684 in the city, and 6,532 in the State of New York.

The census shows a relatively greater number of females in New York county than in any other in the State, except King's—the proportion being 48.1 males to 51.9 females. This inequality is observed in other large cities, and in London the difference is still greater, being 46.8 males to 53.2 females. This disproportion of numbers in large cities has its exceptions. Paris, since 1836, has returned an excess of males, which is explained in the official report, by the large number of young men attracted thither to its seminaries of learning, the crowd of unmarried artificers drawn from the departments, and even from foreign countries, and the numerous male laborers upon public and private works.

Classification by Ages.—The ages when capable of military service with males, and the pro-

ductive period with females, were the original and for a long time the only divisions which the census recognized. The ages of 10, 14, 16, 18, 21, 24, 26, 36, 45, 55 and 60, have been at different times employed in our State. The national census of 1830, 1840 and 1850 adopted periods of 5 to 20, and of 10 years above that age. In the census of 1850, the specific age of each person was required to be reported, thus affording the opportunity for adopting any arrangement that might be desired, even to that of single years. A careful examination of the census reports of Belgium and France, in which the classification by single years had been employed, clearly revealed the tendency which doubtless prevails in all countries, to report the nearest round number instead of the precise year. For example, there were reported in France, in 1851—578,956 as 19 years of age, 618,230 as 20, 555,893 as 21, 495,711 as 29, 690,638 as 30, 467,219 as 31, 420,327 as 39, 665,939 as 40, 401,550 as 41. Thus, instead of descending in a somewhat uniform grade, as would be the case if the existing ages of the whole nation were truly reported, a curve representing the ages would be full of irregularities; yet even in these deviations from truth, there may be traced a symmetry, and the line that would represent the years from 20 to 30, would in a measure correspond in its inflections with that from 30 to 40. It was further found that a mean of five years would correct the inequalities of single years, and produce a series of numbers very nearly regular in their descent, and probably much nearer the existing ages than those derived from single years. The ages of the population were accordingly divided into groups of five years, between 1 and 50, and of ten years above the latter.

The extreme period of life reported in the late census was 120 years. It is to be observed that much doubt attaches to these cases of extreme longevity. In several instances, the Marshals accompanied their reports with dates and particulars which left no doubt concerning their accuracy.

Place of Birth.—The census of 1845 first directed inquiries concerning place of birth, which were of a very general character, and gave in our State a total of 84.8 per cent. native, and 15.2 per cent. of foreign birth. In 1850 the proportions had changed to 78.5 per cent. of the former, and 21.5 per cent. of the latter.

The census of 1855 gave, opposite the name of each person, his county, if in New York; or State or Territory, if in the United States, or foreign country, if abroad. In classifying these returns, we have deemed it proper to give them all the detail which they admitted, as well to show by its origin the general character of our population, as to afford a full and ample means for future comparison. Emigrants settling in numbers together, retain their local peculiarities of language and customs, and we often see re-produced in our State in miniature, the habits, manners, and tone of moral or religious sentiment which characterize the section of Europe, or of New England, where the population of the community may have originated. The concentration of our people in cities and large towns, adds additional interest to this inquiry, by showing the course of the migration which is constantly going on, and the directions which the human current takes in its unceasing fluctuations.

As a class, our people are migratory. Of the heads of families, how few reside in the place where they were born. In this respect, we offer a wide contrast with some portions of Europe.

The tendency of our emigration is westward. If proof were required to substantiate the motto,

"Westward the Star of Empire takes its way,"

let the population of two of our Northern States differing considerably in longitude, be compared. The federal census of 1850 supplies ample data to show the number of those born in Wisconsin, now living in Connecticut, and the reverse; and so on with the other States of the Union. In like manner the present census affords the same facts, though on a smaller

scale, in the statistics of its east and west wide-apart countries.

For example, among the transpositions by migration, there are reported:

In Steuben, born in Otsego.....	1,173
In Otsego, born in Steuben.....	23
In Livingston, born in Washington.....	1,502
In Washington, born in Livingston.....	8
In Jefferson, born in Montgomery.....	1,502
In Montgomery, born in Jefferson.....	55

The following table exhibits the comparative origin of population in the City and State of New York:

Place of Birth.	City	State	Place of B'th.	City	State of
<i>Counties of</i>	<i>of N.</i>	<i>of N.</i>	<i>Counties of</i>	<i>of N.</i>	<i>New</i>
<i>New York.</i>	<i>York.</i>	<i>York.</i>	<i>N. York.</i>	<i>York.</i>	<i>York.</i>
Albany ..	2,158	76,337	Suffolk ..	1,248	36,090
Allegany ..	27	22,516	Sullivan ..	178	17,427
Broome ..	66	21,057	Tioga ..	37	15,915
Cattaraugus ..	16	19,315	Tompkins ..	114	28,089
Cayuga ..	146	38,769	Ulster ..	1,309	55,752
Chaut'que ..	43	27,349	Warren ..	38	14,329
Chemung ..	26	15,347	Wash't'n ..	401	44,925
Chenango ..	89	34,940	Wayne ..	64	26,646
Clinton ..	55	26,619	W'ch'ter ..	4,825	50,896
Columbia ..	1,035	49,347	Wyoming ..	17	18,022
Cortland ..	56	19,118	Yates ..	28	15,220
Delaware ..	526	37,315	<i>States:</i>		
Dutchess ..	2,753	67,804	Maine ..	1,380	5,818
Erie	203	55,597	N. H.	1,001	14,941
Essex	76	20,089	Vermont ..	1,278	54,266
Franklin ..	22	14,426	Mass	6,205	57,086
Fulton ..	50	16,942	R. Island ..	873	11,737
Genesee ..	83	19,023	Conn	7,239	63,691
Greene ..	594	32,849	N. York ..	262,156	2,222,321
Hamilton ..	7	1,834	N. Jersey ..	12,259	40,391
Herkimer ..	131	41,663	Penn	4,949	31,472
Jefferson ..	135	47,178	Del.	53	224
Kings	2,556	56,919	Md.	1,793	2,568
Lewis	24	16,133	D. of Col. ..	231	2,187
Livingst'n ..	40	23,679	Va.	1,377	2,158
Madison ..	95	35,333	N. C.	251	792
Monroe ..	162	46,244	S. C.	493	903
M'gomery ..	249	39,724	Georgia ..	329	672
New York ..	232,151	297,164	Florida ..	53	189
Niagara ..	35	20,095	Ala.	98	208
Oneida ..	600	70,365	Miss	43	163
Onondaga ..	160	53,590	La.	332	695
Ontario ..	141	30,214	Texas ..	43	96
Orange ..	3,176	56,472	Ark.	5	29
Orleans ..	22	13,578	Mo.	99	307
Oswego ..	158	34,478	Tenn	50	185
Otsego ..	162	50,967	Ky.	162	545
Putnam ..	589	14,477	Ohio	575	5,256
Queens ..	1,616	33,924	Indiana ..	63	606
Renssela'r ..	973	63,787	Illinois ..	99	1,255
Richmond ..	753	12,821	Mich	141	3,413
Rockland ..	1,029	13,839	Wis	56	1,163
St. Lawr. ..	65	43,556	Iowa	9	106
Saratoga ..	365	44,620	Cal.	22	51
Schenec'y ..	172	16,332	Territ'es. ..	4	26
Schoharie ..	169	37,797	U States ..	303,721	2,528,444
Schuyler ..	4	6,325	<i>Foreign Countries:</i>		
Seneca	75	19,926	Canada ..	2,040	47,842
Steuben ..	55	38,785	N. Bruns. ..	234	766

Place of Birth.	City	State	Place of Birth.	City	State of	Countries.	No.	P. cent.	No.	P. cent.
<i>Foreign</i>	<i>of N.</i>	<i>of N.</i>	<i>Foreign</i>	<i>New</i>	<i>New</i>	Spain.....	11,251	0.267	583	0.017
<i>Countries.</i>	<i>York.</i>	<i>York.</i>	<i>Foreign</i>	<i>York.</i>	<i>York.</i>	Norway.....	†	....	570	0.017
N. Scotia	551	1,602	Spain...	343	570	Belgium.....	6,991	0.166	454	0.013
Newf'd'd	133	398	Portugal	163	291	Newfoundland.	†	....	398	0.011
W. Indies	1,121	1,846	Poland..	1,200	1,880	South America.	5,440	0.129	296	0.008
Mexico..	66	119	Norway..	227	537	Portugal.....	6,049	0.194	291	0.003
S. Amer.	170	296	Sweden..	554	1,472	Russia.....	938	0.022	256	0.008
England.	22,713	102,286	Russia..	116	256	Mexico.....	15,969	0.379	119	0.007
Scotland.	8,487	27,523	Denmark	327	583					
Ireland..	175,735	469,753	E. Indies	43	104					
Wales..	935	8,557	Africa..	38	76					
France..	6,321	18,366	Turkey							
Belgium.	174	454	& Greece	40	48					
Holland.	756	4,214	Islands of							
Germany	95,986	4,214	the Sea	62	159					
Prussia..	1,586	6,352	Asia...	64	162					
Austria..	331	1,197	At Sea..	103	511					
Switz'l'd	978	3,948	Unknown	3,620	17,238					
Italy...	968	1,231								

These numbers may be reduced to the following generalization for the whole State:

	Number.	Per ct.
Born in New York	2,222,321	64.077
" New England.....	207,539	6.014
" N. Jersey and Pennsylv'ia	71,863	2.071
" Southern States.....	13,124	0.378
" Western States.....	11,876	0.340
" United States.....	2,528,444	72.903
" Foreign countries.....	922,019	26.585
" At sea, and unknown....	17,749	0.512

The relative numbers of our population born in foreign countries having over 100 emigrants in the State, compared to the total immigration into the United States during 36½ years, are as follows:

Countries in the order of their emigrants in N.Y.	Immigration into U.S. in 36½ years.		Residing in New York, June 1, '55.	
	No.	P. cent.	No.	P. cent.
Ireland	*747,930	17.754	469,753	13.549
Germany	1,206,087	28.630	218,997	6.314
England	*207,492	4.925	102,286	2.949
Canada	†91,699	2.177	47,842	1.379
Scotland	*34,559	0.820	27,523	0.794
France	188,725	4.482	18,366	0.529
Wales	4,782	0.114	8,557	0.246
Prussia	35,995	0.854	6,352	0.183
Holland	17,283	0.417	4,214	0.124
Switzerland	31,725	0.738	3,948	0.114
Poland	1,318	0.031	1,890	0.054
West Indies	35,317	0.838	1,846	0.053
Nova Scotia . . . .	†	...	...	...
Sweden	†29,441	0.694	1,602	0.046
Italy	7,185	0.171	1,472	0.042
Austria	†	...	1,231	0.036
New Brunswick . .	†	...	1,197	0.034
Denmark	3,059	0.073	766	0.022

* In addition to the foregoing, 1,346,682, or 32.015 per cent. were born in Great Britain—the divisions not specified.

† British America, the provinces not specified.

‡ Sweden and Norway reported together.

§ Included in Germany.

The question of origin would have been enhanced in interest by an inquiry into the nativity of the immediate ancestors of persons born in the United States. There are few persons of this class who cannot assign an English, Scotch, Irish, German, Dutch, French, or other foreign origin to their forefathers; and the facts which such an inquiry would elicit, might prove interesting in the study of the American character, made up as it is of the intimate and harmonious blending of whatever may be energetic and enterprising, or liberal and independent in these various elements.

Civil Condition.—The census of 1855 is the first that affords data for comparison of the number of single, married and widowed in our population. The general per centages of these were: single, 60.08; married, 36.15; and widowed, 3.77, namely: widowers, 1.02, and widows, 2.75.

In the city of New York, the per centages of these classes were: single, 60.92; married, 34.41; and widowed 4.67, namely: widowers, 1.04, and widows, 3.63.

It is obvious that the proportions of these classes have an intimate relation to the welfare of society, and that an excess of single or of widowed alike indicate conditions which, if continued, must prove disastrous to the body politic.

Celibacy is usually increased by inordinate prices in the necessities of life, rendering the support of families difficult, or by a relaxation of morals like that oftener noticed among the nobility and the aristocratic classes of Europe; while an excess of widow-hood has, from time immemorial, been associated with wars, pestilence and famine.

† British America, the provinces not specified.

‡ Sweden and Norway reported together.

The following comparison with other countries will add interest to this subject:

PER CENTAGES OF THE VARIOUS CIVIL CONDITIONS.

Countries.	Years.	Single.	Mar-ried.	Wid-ows.	Wid-ows.
N. Y. State, all classes..	1855	60.08	36.15	1.02	2.75
Canada ..	1851	66.66	30.81	0.94	1.59
England ..	1821	60.00	33.00	...	...
Eng. & Wales, males...	1851	62.50	33.69	3.80	...
" females...	1851	59.79	32.97	...	7.24
Scotland, males	1851	66.77	29.83	3.40	...
" females	1851	63.71	27.91	...	8.38
Isles of Brit. Seas, males.	1851	63.12	33.44	3.44	...
" fem's ..	1851	60.97	30.93	...	9.06
Great Britain, males...	1851	63.08	33.17	3.75	...
" females ..	1851	60.35	32.24	...	7.41
Belgium, all classes...	1846	63.91	30.39	1.97	3.63
France, males	1851	56.04	39.26	4.70	...
" females	1851	51.99	38.63	...	9.38
Denmark, all classes...	1834	62.00	33.00	...	6.4
Spain	1803	55.00	38.00	...	6.9
Sweden and Finland ..	1809	50.00	34.00	...	6.1
Switzerland	1827	56.00	35.00	...	7.8

It is generally observed, that the number of widows is about twice as great as that of widowers. The returns of marriages relieve the subject of mystery, by exhibiting a correspondingly greater number of widowers united to previously unmarried females.

Of 21,551 marriages reported as occurring in the State during the year preceding June 1st, 1855, the previous civil condition was as follows:

	Numbers.	Per ct.
Single males to single females	17,936	83.2
" to widows	565	2.7
Widowers to single females	2,067	9.7
" to widows	927	4.4

Although the actual numbers here given are manifestly below the truth, it is not probable that the per centages would have been materially varied by the correct return of every marriage; but in saying this we do not wish to advocate either incompleteness or error in documents which ought to be without fault.

Professions and Occupations.—These being specifically required of each adult male above the age of 15 years, and of females having a regular employment other than the ordinary duties of the household, have been classified alphabetically by counties, with such detail as they appeared to require. The following is a list of those reported in the State as giving

employment to 1,000 or more persons, in the order of their numbers in the State:

Professions and Occupations.	City of N. York.	State of N. York.
Farmers ..	193	321,930
Laborers ..	19,748	115,800
Servants ..	31,749	58,441
Carpenters ..	7,901	37,475
Clerks, copyists and acc'tants.	13,897	30,359
Tailors ..	12,609	29,236
Boot & shoe-makers ..	6,745	24,804
Merchants ..	6,001	20,664
Blacksmiths ..	2,611	16,948
Dressmakers and seamstresses ..	7,436	16,939
Masons, plasterers and b'klayers ..	3,634	13,781
Painters, varnishers & glaziers ..	3,400	10,081
Teachers ..	1,268	9,959
Sailors and marines ..	4,714	9,720
Boatmen and watermen ..	1,004	9,136
Grocers ..	4,079	9,056
Coopers ..	1,018	7,539
Carters and draymen ..	5,338	7,350
Cabinet makers ..	2,606	6,656
Machinists ..	1,714	6,309
Butchers ..	2,643	6,308
Physicians ..	1,252	6,010
Milliners ..	1,585	5,862
Coach & wagon mak's ..	449	5,637
Bakers ..	2,856	5,135
Clergymen ..	393	4,810
Lawyers ..	1,112	4,542
Printers ..	1,401	4,339
Students ..	653	4,184
Peddlers ..	1,889	4,131
Stone and m'ble cutters & polishers ..	1,755	4,076
Railroad employees ..	523	4,006
Millers ..	130	3,917
Porters ..	3,052	3,916
Saddle, harness & tr'k makers ..	884	3,895
Mechanics (not otherwise specified) ..	336	3,837
Hotel and innkeepers ..	709	3,755
Tobaccoists ..	996	3,744
Professions and Occupations.	City of N. York.	State of N. York.
Sawyers ..	285	3,729
Ship carpenters ..	1,146	3,632
Laundresses ..	2,563	3,557
Tanners and curriers ..	228	3,416
Gardeners & florists ..	644	3,269
Joiners ..	303	3,256
Drivers ..	1,741	3,253
Engineers ..	567	3,180
Tinsmiths ..	897	3,160
Weavers ..	589	3,141
Moulders ..	593	3,114
Lumbermen & dealers ..	156	2,933
Hat and cap makers ..	1,422	2,926
Teamsters ..	160	2,825
Factory operatives ..	207	2,477
Agents ..	935	2,340
Barbers ..	997	2,142
Bookbinders ..	1,315	2,121
Jewelers ..	1,099	2,055
Furnacemen ..	145	1,807
Boarding-house keepers ..	1,014	1,680
Dealers (not otherwise specified) ..	1,025	1,668
Brickmakers ..	38	1,627
Policemen ..	1,164	1,513
Wheelwrights ..	308	1,498
Manufacturers (not otherwise specified) ..	182	1,448
Apothecaries & druggists ..	521	1,438
Civil officers ..	316	1,427
Cooks ..	755	1,424
Apprentices ..	591	1,421
Millwrights ..	30	1,262
Brokers ..	649	1,233
Musicians ..	746	1,177
Brewers and distillers ..	360	1,176
Carvers and gilders ..	765	1,125
Storekeepers ..	837	1,120
Upholsterers ..	711	1,106
Confectioners ..	704	1,088
Clothiers ..	403	1,084
Builders ..	575	1,081
Piano makers ..	760	1,076
Dairymen & milkdealers ..	579	1,050
Quarrymen ..	52	1,031
Sash and blind makers ..	327	1,004

Each of our censuses is defective, in not exhibiting, in this connection, the number, of all ages and both sexes, dependent upon the different professions and occupations for support. At present, this is left to estimate and vague conjecture. A column should be provided for this in future enumerations.

Families and Dwellings.—The number of these, with the average number of persons in each in 1850 and 1855, compared with those of the United States (white and free colored) and Canada, were :

Year.	Dwellings.		Families.	
	Num-ber.	Pers- ons in each.	Num-ber.	Pers- ons in each.
N. Y. State... 1850	473,936	6.53	566,969	5.46
N. Y. City ... 1850	37,677	13.60	93,608	5.47
N. Y. State... 1855	522,325	6.64	663,124	5.23
N. Y. City ... 1855	42,668	14.79	126,558	4.97
United States 1850	3,362,337	5.94	3,598,195	5.55
Canada..... 1851	.....	.....	293,667	6.27

The total value of dwellings was reported, in 1855, as \$273,481,811 in the city, and \$664,899,967 in the State of New York, being an average of \$6,409 in the former, and \$1,351 in the latter. It is to be remarked that the value of the lot was included with dwellings in cities and villages, but not upon farms.

Voters and Aliens.—These classes possess an inverse relation to each other, the per centage of one increasing as the other diminishes. Both are liable to vary with the definition given them by law, and the statutes of our State Government concerning the former, and of the Federal Government relating to the latter, have been repeatedly modified, since they have been made the subject of report in the census.

The elective franchise was extended by the State Constitution of 1821,* to all white male citizens of the age of 21 years, who paid taxes or performed military duty, or who were by law exempt from taxes or military service. In 1826 the Constitution was amended, by abolishing the property qualification of white voters altogether.†

* Article II, Section 1.

† The popular vote upon this extension of the elective franchise was 127,077 for, to 3,215 against it. Property qualification was continued as respects colored persons, in 1846, by a vote of 114,900 for, to 3,901 against retaining it.

The numbers and per centages of aliens and voters since 1821, have been, in the city and State of New York, as follows:

Years.	1.—Voters.*		Proportion.	
	Number.		City. State.	
	City.	State.	City.	State.
1825.....	18,283	296,132	11.00	18.31
1835.....	43,091	422,034	15.95	19.77
1845.....	63,927	539,379	17.22	20.71
1855.....	88,877	652,322	14.11	19.18

Years.	2.—Aliens.		Proportion.	
	Number.		City. State.	
	City.	State.	City.	State.
1825.....	18,856	40,430	11.33	2.44
1835.....	27,669	82,319	10.24	3.83
1845.....	60,946	153,717	16.14	7.52
1855.....	232,678	632,746	36.93	19.54

Students have usually been enumerated as in 1855, at the homes of their parents or guard-

* As the census of 1855 is the first that has been prepared in this State at a central office, under one supervision, a word of explanation is deemed proper with reference to these classes. In the schedules for obtaining this census, columns were provided for noting the voters and aliens, by a mark opposite the name. In condensing the returns, the age, sex, and place of birth were assumed as correct, and entries inconsistent with these were corrected to agree with them. The following were the principal errors committed by the marshals:—1. Persons under age, or females, marked in column of voters. 2. Natives of United States marked as aliens or naturalized voters. 3. Natives of foreign countries marked as native voters. 4. The head of the family marked as alien, and his wife and minor children of foreign birth not marked. 5. The head of the family marked as naturalized, and his wife and minor children of foreign birth as alien. Of these, No. 1 were stricken from the list of voters; of No. 2, the aliens were stricken out, and the naturalized voters carried to the column of native voters; No. 3 were carried to the column of naturalized voters; No. 4 were marked as all alien; and No. 5 were stricken from the column of aliens.

In other and less frequent cases, as that of children of citizens born in foreign countries, &c., such corrections were made as the definition of aliens and voters by existing statutes appeared to warrant.

In comparing the per centage of this class to the total population at different times, there will be observed an inequality and apparent inconsistency, which is not so much due to corresponding differences in number, as to imperfection of the returns, and the absence of system in reducing them to a general result. Judging from the original reports of the present census, there is no department of its inquiry in which there was more need of careful revision, or greater necessity for the application of uniform rules for its arrangement. By strictly applying the legal definitions to every case of manifest inconsistency and error, it is believed that the present census affords a very close approximation to the actual numbers of these classes at the date to which it refers.

ians, and not at the places of their temporary residence at an academy or college.

The numbers attending private, district, and the higher schools and seminaries of the State, were not reported in the present census, being considered as mostly shown in the reports of the Superintendent of Public Instruction, and the Regents of the University.

An inquiry was, however, instituted, with the view of ascertaining the number of students from other States attending colleges and professional schools in the State of New York, and those from New York attending in other States. The published catalogues of about 100 of these institutions, for the years 1854-'55, which were examined with the view of determining this point, gave the following results. They are somewhat imperfect, by not embracing all of these institutions in the Union, but the deficiency being chiefly in Southern and Western colleges, would not materially vary the relative numbers, as respects this State:

Number and Location of Colleges.	Total, except Preparatory Departm't.	Professional From New York.	Scientific From other States.	Undergraduates From New York.	Undergraduates From other States.
14 colleges in New England	3,190	67	678	354	2,032
15 coll. & professional schools in N. Y. ..	2,182	509	351	992	330
3 coll. in N. Jersey ..	366	...	...	72	285
8 coll. & prof. schools in Penn.	1,794	17	1,010	10	722
37 coll. in Southern and S. Western States	4,850	7	1,381	9	3,355
23 coll. in Western States	2,089	36	822	34	1,178
Total	14,471	636	4,242	1,471	7,902
Percentage of prof. students from N. Y.	13.04				
" " from other States.	86.96				
Percentage of undergraduates from N. Y.	15.69				
" " from other States.	84.31				

Deaf and Dumb, Blind, Insane and Idiotic.—These classes have for many years been included in the census. There are apparently insurmountable difficulties attending the procuring of full and reliable statistics of some of these unfortunate classes, and especially of the latter. Their increase, according to the census, has borne no comparison with that of the total

population—an inference which no reason would justify, and which, of itself, would throw a doubt upon the correctness of these enumerations.

As there is a general agreement between each census upon this point, we may safely charge the fault upon the system, and seek other modes of obtaining full and official returns upon these subjects. Perhaps there could be found no better method than a concerted and systematic inquiry by resident physicians, having definite districts for examination, and furnished with uniform blanks and instructions for ascertaining the cause, duration, hereditary tendency, dependence upon public or private aid for support, and the various circumstances of their condition, which, by affording a knowledge of the *causes* of their maladies, lead to a reduction of their frequency.

The numbers of the total population to each one of these classes reported since 1825, were as follows:

State of N. Y.	Deaf and Dumb.	Blind.	Insane.	Idiotic.
1825.	2,503	....	1,971	1,135
1835.	2,331	2,446	2,249	1,464
1840.	2,184	2,517	*1,036	*....
1845.	2,407	2,969	1,201	1,755
1850.	2,452	2,623	1,229	1,798
1855.	2,431	3,051	1,264	1,972
United States.—Whites.				
1830.	1,965	2,652	....	....
1840.	2,124	2,825	969	....
1850.	2,140	2,451	1,305	1,372

The numbers actually reported in the city and State of New York, have been as follows:

City of New York.*				
Years.	Deaf and Dumb.	Blind.	Insane.	Idiotic.
1825.	56	...	193	46
1835.	177	106	176	34
1840.	250	144	201	..
1845.	254	80	539	47
1855.	411	316	655	52

State of New York.				
Years.	Deaf and Dumb.	Blind.	Insane.	Idiotic.
1825.	645	....	819	1,421
1835.	933	889	967	1,484
1840.	1,112	965	2,340	....
1845.	1,082	877	2,168	1,620
1855.	1,422	1,136	2,742	1,812

* The inmates of special asylums were enumerated in the institutions where they were residing. This explains the disproportionately large number of some classes in the city of New York.

Owners of Land.—The number of all classes reported as holding land, by deed, contract or perpetual lease, was 361,013, or 10.41 per cent. of the total population. The number in New York city was 14,784, or 2.34 per cent. We have no data for comparison with other periods or other countries.

Adults unable to Read and Write.—We have three enumerations of these classes; those of 1840, 1850, and 1855, the ages in the two former being above 20, and in the latter above 21 years. The City and State of New York compare with each other and with the United States as follows:

Classes and Years.	Numbers.		
	City of N. Y.	State of N. Y.	United States.
Whites, 1840.....	7,775	44,452	549,693
Whites, 1850.....	17,140	91,293	962,898
Colored, 1850.....	1,667	7,429	90,522
Total, 1855.....	25,858	96,469	.....
Classes and Years.	Percentage to total of each class.		
	City of N. Y.	State of N. Y.	United States.
Whites, 1840.....	2.62	1.87	3.87
Whites, 1850.....	3.41	2.99	4.92
Colored, 1850.....	12.07	15.14	20.83
Total, 1855.....	4.10	2.78	.....

The greatest per centage of the illiterate was reported from Clinton County (10.47 per cent.), chiefly among the Canadian French settlers.

The nativities of those 21 years old and upwards unable to read and write, were as follows, as regards the City and State of New York:

Countries.	City of N. York.		State of N. York.	
	Males.	Females.	Males.	Females.
United States.....	1,108	955	12,128	8,667
Canada.....	25	28	4,541	3,272
England.....	97	162	1,526	949
Scotland.....	20	41	91	102
Ireland.....	6,383	14,995	23,644	35,941
France.....	43	56	305	297
Germany.....	597	856	1,805	2,202
Switzerland.....	3	6	39	37
Other European....	260	223	473	397

Having now noticed the more prominent results of the census of 1855, with regard to the various classes of the population, and the deductions that may be drawn from a comparison of successive enumerations, I find it necessary to close without extending the subject to include statistics of marriages and deaths, agri-

culture, manufactures, religious societies, and the periodical press. The returns of some of these were much less reliable and satisfactory than those of the personal census—especially those concerning manufactures. Amidst the infinite diversity of details, and unlimited amount of combinations and varieties; in the absence of authentic and definite statements of the amount and value of raw materials and products; in the unwillingness frequently expressed to giving this key to prosperity or loss in business; in the constant recourse to memory for data, which, although offered with honest intentions, may differ widely from the true facts; and in the disposition, sometimes shown, to understate the results of the manufacture, with the view of avoiding taxation or rivalry on the one hand, or creating a fictitious credit or reputation by exaggerating the extent of their transactions on the other, we find abundant cause to doubt the precision with which these returns are made, and to question the soundness of positive deductions that may be drawn from them. The greatest difficulty in reducing these returns, is that of analyzing the results of several manufactures, carried on by the same person or company, and often so blended as to render separation impossible. A machine-shop may, for example, often comprise in one establishment departments elsewhere reported separately, as a furnace, brass-foundry, manufactory of agricultural implements, of steam engines, or of numerous other special machines or products, and an unlimited number of departments for the working of metals and wood. Perhaps no two of these establishments would compare with each other in the statistics of their business, and the correct analysis of any considerable number of large manufactories of this diversified class, would involve more time and attention than have often been allowed in the census.

Still, these results are useful for comparison with one another, and, in the aggregate, may prove approximately near the truth. By a careful study of the difficulties which attend this class of statistics, the ends to be gained,

the agencies to be employed, and the system of classification best adapted for representing the result to the greatest advantage, it is hoped that a plan may be formed for securing fully all the purposes to be desired from them.

POPULATION OF THE WORLD.

Petermann's Journal for January last contains a series of interesting chapters, prepared by Prof. C. F. W. Dieterici, Director of the Statistical Bureau of Prussia, and presented to the Berlin Academy of Sciences in March, 1858. In these the compiler promulgates an estimate of the present population of the world, which, from such a source, will be accepted by the statistician as a near approximation to accuracy. These are accompanied with a map of the world, exhibiting, by means of shadings, the density of the population in its several parts.

The Professor arranges his tabulations under three heads. The first of the series refers to simple enumerations in the several countries; the second divides the population by races, and the third arranges the whole in accordance with their religious affiliations.

According to the first of the serial tabulations, and omitting fractional numbers, the totals of the several grand divisions of the world sum up as follows:

	Square miles.*	Population.	Pop. to sq. m.
Europe	3,879,634	272,000,000	70.1
Asia	16,871,735	755,000,000	44.8
Africa	11,550,862	200,000,000	17.3
America	15,938,669	59,000,000	3.7
Australia	3,430,855	2,000,000	0.6
Antarctic Lands	48,520	.....	0.0
World...	52,120,275	1,288,000,000	24.7

The greatest density of any country in Europe is found in Belgium, where it is 402 to the square mile. In some districts in England, however, it is much higher. In the county of Middlesex the density is 6,683, but this is exceptional, being the metropolitan county; and in Lancashire, the great center of manufactures,

* Reduced from German square miles—1 = 21½ English square miles

it is 1,064 to the square mile. In Asia, the densest population is in China Proper and in Northern India. Other parts of the world are comparatively destitute of population. In America the average is generally low, yet in certain districts may compare well with countries of moderate population.

The tabulations on the distribution of the population by races, are preceded by a sketch of Retzius' new craniological system, with its two grand divisions of oval heads (*dolicho-cephalous*) and broad or cubic heads (*brachy-cephalous*). In the first are included all the Latin and German nations of Europe, 157,000,000; and in the latter the Slavic, Magyar, Turkish, and some of the Romanee nations of the south. In Asia, the Chinese, Hindoos, Arian Persians, Arabs, Jews, and Tungusians, 610,000,000, are oval heads; and all other Asiatics are noted as broad heads. The estimate for America is based, of course, on aborigines only. All the rest are immigrants and their descendants, or more or less mixed. In regard to the American aborigines, the opinion is advanced, that from the islands around Behring's Strait, along the west coast to Cape Horn, the native population consists principally of broad heads; and that on the east coast, from Labrador downwards to the same southern extremity of the continent, the oval heads predominate. This would coincide with Humboldt's theory, that the west coast was peopled from Asia. In Australia, the broad and oval heads are probably evenly divided. The footing-up of the tables of this view of the subject is as follows:

	Oval Heads.	Broad Heads.
Europe	157,000,000	105,000,000
Asia	610,000,000	145,000,000
Africa	200,000,000	.....
America	58,000,000	1,000,000
Australia	1,000,000	1,000,000
Total.....	1,026,000,000	252,000,000

The same ethnological writer makes still another division of races according to facial angularity, into *orthognathes* and *prognathes*—the first having upright faces, and the latter protruding jaws and receding foreheads. Both

classes are found among the oval and broad heads, and are thus summed up:

	Upright Faces.	Receding Faces.
Europe	272,000,000	.....
Asia.....	224,000,000	531,000,000
Africa .....	.....	200,000,000
America	58,000,000	1,000,000
Australia	1,000,000	1,000,000
Total	555,000,000	733,000,000

The excess of the latter over the former is attributable to the population of Africa, which must be classed entirely with the receding-faced races, and this in spite of the anomaly of their being oval-headed.

The preceding strictly scientific classifications are followed by the classification as established by Blumenbach. The five classes into which the human race was divided by that physiologist, are distributed as follows:

1. CAUCASIAN (28.86 per cent.):	
In Europe (except Lapps and Finns) ..	270,000,000
In Asia (Turks, 15; Arabs, 5; Persians, etc., 11; Siberians (in part), 3; foreigners in Eastern Asia, 2) ..	36,000,000
In Africa (Arabs and foreigners)	4,000,000
In America (all except Indians)	58,000,000
In Australia (colonists)	1,000,000
Total Caucasian	369,000,000
2. MONGOLIAN (40.61 per cent.):	
In Asia principally; but in Europe the Lapps and Finns	522,000,000
3. ETHIOPIAN (15.08 per cent.)	196,000,000
4. AMERICAN (0.08 per cent.)	1,000,000
5. MALAY (15.38 per cent.):	
In Further India, 84; in the Indian Islands, 80; in Japan, 35; and in Australia, 1,000,000	200,000,000
Grand total	1,288,000,000

The tabulation of the population (assuming the whole at 1,300,000,000), according to religions, is stated in the following scheme:

Christians (25.77 per cent.):	
Roman Catholics (50.7 p. c.)	170,000,000
Protestants (26.6 p. c.)	89,000,000
Greeks (22.7 p. c.)	76,000,000
.....	335,000,000
Jews (0.38 per cent.)	5,000,000
Asiatic religions (46.15 per cent.)	600,000,000
Mahomedans (12.31 per cent.)	160,000,000
Heathen (15.39 per cent.)	200,000,000
Assumed grand total	1,300,000,000

There can be no hesitation in accepting these results as approximative. The compiler is a

man of rare ability, and had every necessary material at hand to verify his estimates. Moreover he is a conscientious author, and can have had no motive to treat his subject otherwise than in a candid spirit of enquiry. His estimate for America, however, is evidently too low; and in another part of this number of the JOURNAL a more reliable statement is given. In the Journal, No. 4, the population of Europe is shown to be 174,183,427, or 2,000,000 above the estimate of Dieterici. R. S. F.

EXTENT AND POPULATION OF AMERICA.

Latest Census Returns and Estimates.

1.—NORTH AMERICA.

Countries, etc.	Area, sq. m.	Population.	sq. m.	Pop.,
Greenland and Arctic Lands	1,000,000	.....	.....	.....
Danish settlements	3,952	9,892	2.5	
Russian America	481,276	54,000	0.1	
Hudson's Bay Ter. ..	2,340,000	46,800	0.0	
Vancouver's Island ..	16,000	1,600	0.1	
British Columbia	148,000	14,800	0.1	
Assiniboia (Red Riv.) ..	.....*	6,691	.....
Canada West	147,832	1,350,923	9.2	
Canada East	209,990	1,220,514	5.9	
New Brunswick	27,704	213,183	7.7	
Nova Scotia, etc.	18,746	303,728	16.2	
Prince Edward Isl'd. ..	2,134	68,946	32.3	
Newfoundland	35,913	119,336	3.4	
Bermuda Islands	19	12,201	642.1	
St. Pierre & Miquelon, Fr'ch ..	81	2,226	27.4	
United States of America ..	2,963,666	29,636,666	10.0	
United States of Mexico ..	829,916	7,859,564	9.4	
British Honduras	18,604	12,401	0.6	
Guatemala ..	43,380	971,450	22.4	
Honduras ..	39,600	358,000	9.5	
Salvador ..	9,600	394,000	41.0	
Nicaragua ..	40,200	257,000	6.3	
Costa Rica ..	21,800	215,000	9.8	
Mosquitia ..	26,000	6,000	0.2	
Total	8,424,413	43,134,918	5.1	

2.—WEST INDIAN ARCHIPELAGO.

Countries, etc.	Area, sq. m.	Population.	sq. m.	Pop.,
Cuba	47,278	1,449,462	30.7	
Porto Rico ..	3,865	562,134	14.6	
Virgins ..	143	2,600	18.2	
Hayti ..	10,081	572,000	56.7	
Dominica ..	17,609	136,700	7.9	
Bahama Islands ..	5,094	27,519	5.4	
Turk's Island, etc.	430	4,428	10.3	
Jamaica ..	6,250	377,433	60.4	
Cayman Islands ..	260	1,760	6.8	
Tortola, etc.	219	46,312	211.4	
Anguilla ..	34	3,052	89.8	
Barbuda ..	72	1,707	23.7	

* Included in Hudson's Bay Company's Territories.

Countries, etc.	Area, sq. m.	Population.	sq. m.	Pop.
St. Christopher	68	23,177	340.9	
Nevis	21	9,601	457.2	
Antigua	108	37,757	349.6	
Montserrat	47	7,653	162.9	
Dominica	274	22,061	80.5	
St. Lucia	296	24,516	82.9	
St. Vincent	132	30,128	228.2	
Barbadoes	166	135,939	818.9	
Grenada	155	32,671	210.8	
Tobago	144	13,208	91.7	
Trinidad	2,020	68,645	33.9	
Guadaloupe	529	134,574	254.4	
Marie Galante	59	12,749	216.0	
Desiderade	17	2,568	151.1	
Les Saintes	5	1,311	262.5	
St. Martin (N. part)	24	3,773	157.1	
Martinique	382	123,701	323.8	
Curaçao	138	16,831	121.9	
Bonaire	83	2,339	28.2	
Aruba	23	3,201	139.2	
St. Eustatius	97	1,856	19.1	
Saba	16	1,709	106.8	
St. Martin (S. part)	12	2,918	243.2	
St. Thomas	27	13,666	506.1	
Santa Cruz	78	23,729	304.2	
St. John	22	2,228	101.3	
St. Bartholomew, (Swedish)	25	9,000	360.0	
Total	96,293	3,946,616	40.9	

3.—SOUTH AMERICA.

Countries, etc.	Area, sq. m.	Population.	sq. m.	Pop.
Granadan Confederation	521,948	2,363,054	4.51	
Venezuela	426,712	1,361,386	3.19	
Ecuador	206,692	1,108,042	5.36	
British Guayana	96,315	127,695	1.32	
Dutch Guayana	59,764	60,080	1.01	
French Guayana	27,509	22,010	0.80	
Brazil	2,973,406	7,677,800	2.59	
Bolivia	473,298	2,326,126	4.91	
Peru	498,726	2,106,492	4.22	
Chile	249,952	1,558,319	6.23	
Argentine Republic	832,129	1,166,000	1.39	
Buenos Ayres	294,136	303,355	1.03	
Paraguay	86,102	600,000	6.99	
Uruguay	73,538	177,300	2.41	
Patagonia, etc.	210,000	210,000	1.00	
Falkland Islands	6,297	2,600	0.41	
Total	7,036,524	21,150,259	3.01	

RECAPITULATION.

Countries, etc.	Area, sq. m.	Population.	sq. m.	Pop.
North America	8,424,413	43,134,918	5.1	
West Indies	96,303	3,946,616	40.9	
South America	7,036,524	21,150,259	3.01	

Grand total 15,557,230 68,231,793 4.4

and to this ought to be added, for uncivilized Indians not included in the above returns—for North America 1,000,000, and South America 1,500,000; which, together with the above enumerated population, will give the aggregate

of human beings now inhabiting the Western World at 70,731,793.

The division of this population according to race, is approximately thus:

	N. Am.	W. Ind.	S. Am.	Total.
Whites	76	24	16	38.7
Blacks	8	76	24	36.0
Indians	16	..	60	25.3

—according to civil condition, thus:

	N. Am.	W. Ind.	S. Am.	Total.
Free	90	85	80	85.0
Slave	10	15	20	15.0

—and according to creed, thus:

	N. Am.	W. Ind.	S. Am.	Total.
Protestant	70	20	1	30.3
Roman Catholic	25	80	66	57.0
Pagan	5	..	33	12.7

The number of Jews is too small to affect these results.

Massachusetts is the most densely populated portion of the United States, and in 1855 had 145.3 inhabitants to the square mile; and Rhode Island is the next most populous State. Beyond the limits of the Union, Salvador and Nova Scotia, and among the North American islands, the Bermudas and Prince Edward Island, are the most densely peopled.

But the island of Barbadoes, in the West Indian Archipelago, is the most populous spot in America, having no less than 818.9 inhabitants to the square mile. The same density would give Cuba 37,715,954 inhabitants.

In South America, the most dense population is found in the Andine region, and it is remarkable to see how materially the ratio falls off as the States severally include a greater portion of plain country. Chile, not occupying any of the eastern plain, stands highest in respect of density. Paraguay is an exception to this law, as it is also exceptional in its physical and historical relations.

R. S. F.

POPULATION OF SAN FRANCISCO.

The Directory of San Francisco for the year 1859 states the population in May of that year to have been as follows:

Whites	49,343	males, and	23,985	females. = 73,328
Chinese ..	2,560	" and	590	" = 3,150
Colored ...	915	" and	690	" = 1,605

Total 52,818 " and 25,265 " = 78,083

Males over 21 years—White 38,890, Chinese 2,510, and colored 745; and females over 18 year—15,196, 540 and 531 respectively.

ELEMENTARY STATISTICS OF EUROPEAN STATES.

No. 4.

COMMERCE AND NAVIGATION.

Countries.	Year.	Value of	Value of	Cleared.		Entered.	
		Exports.	Imports.	Vessels.	Tons.	Vessels.	Tons.
Austrian Empire	1857	\$117,839,972	\$144,696,748	15,307	1,247,427	15,378	1,213,344
Belgium	1856	81,395,900	79,959,200	2,627	534,497	2,572	521,704
Bremen	1857	46,957,104	55,503,585	3,053	555,842	2,985	550,210
Denmark	1856	18,884,282	37,578,910	9,313	755,648	9,358	762,680
French Empire	1857	378,597,100	397,959,260	15,977	2,590,166	25,726	4,121,777
Great Britain, etc.	1857	610,776,185	938,231,675	46,859	11,035,915	45,400	10,553,134
Greece	1855	2,308,533	4,301,282	595	173,736	814	229,412
Hamburg	1857	231,297,851	258,318,488	5,033	1,231,842	5,067	1,250,499
Hanover .....	.....	.....	.....	.....	.....	.....	.....
Holland	1857	135,299,348	164,696,461	8,833	1,685,280	8,783	1,613,319
Ionian Islands	1856	2,859,556	3,446,059	.....	500,928	.....	504,696
Lubeck	1857	.....	67,258,444	1,111	145,758	1,131	146,372
Mechlenburg	1856	.....	.....	.....	92,929	.....	115,471
Modena .....	.....	1,666,000	2,000,000	.....	.....	.....	.....
Oldenburg	1857	.....	.....	6,676	321,690	7,591	344,070
Portugal	1855	17,006,844	21,842,282	9,386	822,043	8,970	762,391
Prussia	1857	.....	.....	.....	600,254	.....	571,661
Roman States	1856	9,685,282	9,797,822	6,586	596,624	7,597	596,988
Russian Empire	1856	128,199,896	98,049,952	10,470	1,857,368	10,976	1,874,808
Sardinia	1856	38,603,553	53,463,067	7,464	842,225	7,488	845,413
Spain	1856	53,181,355	65,207,904	8,608	783,328	9,409	935,300
Sweden	1856	17,891,446	15,837,080	10,565	876,768	6,733	401,760
Norway	1855	29,343,500	17,904,200	10,670	1,089,262	10,502	1,028,003
Turkey	1857	51,872,240	59,115,485	14,147	2,892,641	14,193	2,665,125
Tuscany	1856	11,582,827	15,032,839	4,988	492,600	4,961	481,906
Two Sicilies—Naples	1855	13,139,300	11,040,390	945	250,654	1,085	265,953
Sicily	1855	.....	13,712,400	.....	.....	.....	.....

The following exhibits the number of vessels, with their tonnage, and the number of seamen belonging to the principal nations.

Countries.	Vessels.	Tons.	Seamen.
Austrian Empire	9,651	376,239	.....
Belgium	142	40,397	.....
Bremen	279	166,367	.....
Denmark	5,359	226,723	.....
French Empire	12,724	998,996	.....
Great Britain, etc.	26,177	4,367,956	205,727
Greece	4,339	325,000	29,000
Hamburg	491	191,244	.....
Hanover	2,684	105,584	.....
Holland	2,428	586,941	.....
Ionian Islands .....	.....	26,801	.....
Lubeck	69	12,480	.....
Mechlenburg	357	78,278	.....
Modena .....	.....	.....	.....
Oldenburg	595	61,840	2,681
Portugal .....	.....	.....	.....
Prussia	1,035	340,000	9,407
Roman States	1,842	41,360	10,776
Russian Empire .....	.....	.....	.....
Sardinia	2,934	197,924	31,987
Spain	11,952	455,685	124,891
Sweden	2,874	252,472	.....
Norway	3,772	383,089	22,904
Turkey .....	.....	.....	.....
Tuscany	959	590,023	.....
Two Sicilies—Naples	10,863	202,318	.....
Sicily	2,031	47,438	.....

A COINCIDENT PERIOD IN AMERICAN STATISTICS.

By adding successively a cipher or ciphers, the figures "29,636" will express the present (1st July, 1859) sum of the railroads, post routes, territorial extent and population of the United States. Thus we have approximately :

29636..... miles of railroad,
 296360..... miles of post-route,
 2963600..... square miles of territory,
 29636000..... mouths in population,

—facts exhibiting in their representative numbers a progression equivalent to our dollar, dime, cent and mill system of money; and eminently typical of American "go-ahead-iveness," which abhors to do anything by halves. Such a concurrence of arithmetical ideosyncracies may never again occur, and never will unless our "fillibusters" succeed in enlarging "the area of freedom" in a ratio commensurate with the expansion of our population and the development of our means of internal communication.

STATISTICS OF AMERICAN STATES.

NO. 7.

GRANADAN CONFEDERATION.

(Formerly the "Republic of New Granada.")

Lat. 12° 30' N. to 3° 40' S. | Populat'n (1856) 2,363,054.
 Long. 65° 50' to 83° 10' W. | Density, 4.51 to sq. mile.
 Area, 521,948 sq. miles. | Capital, SANTA FE DE BOGOTA.

GOVERNMENT.

Executive.—A President, elected by the people for four years. The present incumbent was elected 20 July, 1857.

Administration.—1. Minister of the Interior; 2. Minister of Foreign Relations; 3. Minister of Finance, all appointed by the President; and 4. the Attorney General.

Legislature.—A Congress, consisting of a Senate of twenty-four members, three from each State, and a House of Representatives of thirty-eight members, apportioned in the ratio of one to every 70,000 inhabitants, and an additional member where any State has a fractional remainder of 25,000 or upwards. Members of both houses are elected by direct popular vote for two years. The annual session commences 1st Feb., and its duration is limited to 70 days. Members, though they can only vote in their respective houses, may speak in both or either.

Judiciary.—A Supreme Court at the capital, with three justices elected by the people; and circuit and district courts. The Attorney-General is elected for four years, as are also the justices of the Supreme Court, the latter being also the judges of the circuits.

National Religion.—The Holy Apostolic Roman Catholic. The establishment is under the charge of the Archbishop of Santa Fe de Bogota, and the Bishops of Popayan, Pamplona, Antioquia, Cartagena and Santa Marta. All other religions are tolerated and protected.

State Organization.—Each of the eight States composing the Confederation has its separate Governor, Legislature and Judiciary, and is entirely independent in all that relates to its internal affairs. The national government alone has cognizance of foreign relations.

STATES OF THE CONFEDERATION.

(According to the Constitutional Law of 27 Feb., 1855.)

States, etc.	Old Provinces.	Population.
PANAMA	Panama	52,522
(Cap., Panama)	Asuero	34,643
—29,905 sq. m.	Veraguas	33,864
	Chiriqui	17,279—138,308
BOLIVAR	Cartagena	103,783
(Cap., Cartagena)	Sabanilla	48,167
—34,372 sq. m.	Mompox	30,207—182,157

States, etc.	Old Provinces.	Population.
MAGDALENA	Santa Marta	36,485
(Cap., Santamarta)	Rio Hacha	17,247
—36,109 sq. m.	Valle d'Upar	14,032
	Ocana (part)	5,222—72,986
SANTANDER	Ocana (part)	18,680
(Cap., Pamplona)	Pamplona	62,990
—19,637 sq. m.	Santander	21,282
	Soto	54,767
	Socorro	157,085
	Velez (part)	64,024—378,828
ANTIOQUIA	Antioquia	75,053
(Cap., Antioquia)	Cordoba	90,841
—33,715 sq. m.	Medellin	77,494—243,388
BOYACA	Tunja	133,463
(Cap., Tunja)	Tundama	152,753
—54,849 sq. m.	Casanare	18,573
	Velez (part)	45,397—350,186
CUNDINAMARCA ..	Bogota	144,592
(Cap., BOGOTA)	Cundinamarca	81,215
—116,480 sq. m.	Mariquita	86,894
	Tequendama	56,126
	Zipaquirá	83,125
	Neiva (part)	94,918—546,870
CAUCA	Choco	43,649
(Cap., Popayan)	Buenaventura ..	31,150
—196,981 sq. m.	Cauca	70,748
	Popayan	77,105
	Pasto	27,620
	Barbacoas	26,519
	Tuquerres	43,107
	Neiva (part)	6,757
	Ter. del Cauqueta ..	3,676—330,331
Total population		2,243,054

RACES AND CASTES.

Caucasians	450,003
American civilized races	301,000
Negros	80,000
Mixed—Quadroons	30,054
Mestizos	998,997
Mulattoes	283,000
Zamboes	100,000
1,412,051	

—and besides there are of uncivilized Indians dwelling in the plains from 108,000 to 120,000.

PROGRESS OF POPULATION.

Year	Population.	Incr. per cent.
1770	806,209	
1783	1,046,641	1770-1783
1825	1,258,259	1783-1825
1835	1,687,109	1825-1835
1843	1,932,279	1835-1843
1853	2,243,054	1843-1853

CHIEF TOWNS.

Bogota (capital) 29,649, Guaduas 9,049, Choconta 8,460, Neiva 7,716, Ybague 7,152, Ubaté 6,754, Tocayma 6,574.
 Popayan 22,708, Cali 11,848, Pasto 8,136,

Cartago 6,744, Buga 6,513, Tuquerres 6,100, Barbacoas 5,249.

Medellin 13,755, Antioquia 8,637, Rio Negro 3,099.

Velez 11,178, Moniquira 9,127, Tunja 5,122, Santa Rosa 4,996, Leiva 3,305.

Socorro 15,015, Bucaramanga 10,018, Pamplona 9,095, San Jose 5,741, Ocana 5,046.

Cartagena 9,896, Mompox 7,336, Santa Marta 4,340, Rio Hacha 2,974.

Panama 6,566, Aspinwall 2,000, David 2,800, Los Santos 2,004, Chagres 1,340, Porto Bello 1,185.

COMMERCE.*

	1855-'56.	1856-'57.
Imports.....		\$3,255,843
Exports.....	\$7,929,350	7,064,584

Distribution of Commerce, 1856-'57.

Imports.	Exports.
U. Kingdom...\$1,748,682	U. Kingdom...\$3,466,645
France.....676,306	Bremen.....1,340,577
United States...302,016	Venezuela....915,277
Venezuela....212,962	United States..434,487
West Indies...185,249	Peru.....427,572
Peru.....62,322	West Indies...264,838
Bremen, etc...34,581	France, etc...124,507

COMMERCE WITH UNITED STATES.

(From Report of U. S. Treasury Department.)

Years.	Domestic Produce.	Foreign Produce.	Total Exports.	Imports into U. States.
1849.....	\$244,460	\$53,324	\$297,784	\$158,960
1850.....	970,619	285,600	1,256,219	591,992
1851.....	2,507,701	533,121	3,040,822	695,606
1852.....	1,298,236	217,558	1,515,794	750,527
1853.....	753,391	103,079	856,470	553,528
1854.....	855,254	82,052	937,306	1,478,520
1855.....	892,245	169,800	1,062,045	1,799,672
1856.....	1,444,943	166,549	1,611,392	2,325,019
1857.....	1,770,209	267,480	2,037,689	2,468,169
1858.....	1,489,583	199,084	1,688,667	3,099,721

The great difference in the value of the commerce as given by the New Granadan and American returns is found in the fact that the first takes no note of the supplies for the railroad and steamship service of the Isthmus.

FINANCES.

	Revenue.	Expenditures.
1851-'52.....	\$1,553,513	\$2,145,779
1852-'53.....	2,227,567	2,842,184
1853-'54.....	1,939,662	2,731,950
1854-'55.....	1,461,535	2,029,531
1855-'56.....	1,895,983	1,456,148
1857-'58.....	1,916,508	1,839,078

Public Debt, 1856.....\$33,129,730

* Not including the transit commerce of the Isthmus.

PRODUCTION OF GOLD 1856-'57.

From washings without machinery.....	\$1,669,000
" rivers with machinery.....	1,000,000
" veins by chemical process.....	687,923
Total production.....	\$3,356,923

PANAMA RAILROAD.

Opened for traffic from Aspinwall—

1852, 1 March, to Abasco Lagato.....	13 miles.
" 13 " to Bujio Soldado.....	16 "
" 6 July, to Barbacoas.....	23 "
1854, 31 January, to Obispo.....	31 "
" 1 September, to Summit.....	37 "
1855, 28 January, to Panama.....	47½ "

ARMED FORCE.

In 1857, by a law of Congress, the regular army was reduced to 500 men, who were to form a demi-battalion of light infantry, to be stationed at Bogota. Besides this force there are two companies of light infantry in the State of Cauca, and one regiment of artillery of four companies, a part of which is stationed at Panama, and the remainder at Cartagena and Santa Marta. The national guard or militia is charged with the quiet of the interior, and belongs to the States severally.

WEIGHTS, MEASURES AND MONEYS.

Old—On the Spanish basis.

New—French metrical values. R. S. F.

BRITISH MERCANTILE MARINE.

(Official Return, December 31, 1856.)

1.—TOTAL SHIPPING.

	Vessels.	Tons.	Seamen.
England and Wales ..	19,778	3,461,031	156,913
Scotland ..	3,354	592,974	29,987
Ireland ..	2,203	250,455	13,403
Isle of Man and Channel Islands ..	842	62,496	5,424
Colonies.....	9,835	945,480	61,846
Total	36,012	5,312,436	267,573

2.—STEAM VESSELS—(included in above.)

	Vessels.	Tons.
England and Wales	1,272	275,635
Scotland	270	73,534
Ireland	145	35,869
Isle of Man.....	6	1,192
Channel Islands	4	232
Colonial.....	253	32,275
Total	1,950	418,737

3.—SEAMEN.

England and Wales.....	156,913
Scotland	29,987
Ireland	13,403
Isle of Man and Channel Islands ..	5,424
Colonies	61,846
Total.....	267,573

LIBRARY DEPARTMENT.

BOOKS, MAPS AND CHARTS, ETC.,

Purchased and donated since last Report.

BOOKS, ETC., ADDED BY DONATION.

CANADIAN WORKS—(*Presented by the Library of Parliament.*)

- Salmon Fisheries of the St. Lawrence and its tributaries. Montreal, 1857. 1 vol., 12mo., pp. 144; cloth.
 - Geological Survey of Canada. Reports for 1853, '54, '55 and '56. Toronto, 1 vol., 8vo., pp. 494; cloth.
 - Geological Survey of Canada: Sir W. E. Logan, Director. Figures and Descriptions of Canadian organic remains. Decade III. Montreal, 1858, 1 vol., 8vo., with plates. bound.
 - Report on the Exploration of the Country between Lake Superior and the Red River Settlement. Toronto, 1856. 1 vol., 8vo., with plates; bound.
 - Catalogue of the Library of Parliament: Books on America and General Index. Toronto, 1858. 1 vol., 8vo., pp. 822; cloth. [This volume is continuous from the volume published in 1857, and is paged from 1072 to 1896.]
 - Report from the Select Committee on the Hudson's Bay Company. (House of Commons, 1857.) 1 vol., 4to., pp. 548; bound.
 - Tables of the Trade and Navigation of the Provinces of Canada for the year 1857. Toronto, 1858. 1 vol., 8vo., pp. 262; cloth.
 - Map of the Northwest part of Canada, the Indian Territories and Hudson's Bay. Compiled and drawn by Thomas Divine, Provincial Surveyor, etc. Toronto, 1857. (On cloth, dissected and enclosed in a handsome case resembling a quarto volume.)
 - The Canadian Directory for 1857, '58. Montreal. Jno. Lovell. 1 vol., large 8vo., pp. 1544.
- BRITISH COLUMBIA—(*Presented by Hon. Charles P. Daly.*)
- Papers on the Affairs of British Columbia: (Blue Book.) London, 1859. 1 vol., folio, pp. 84, with map.
- AGRICULTURE—(*Presented by Benj. Perley Poore, Esq.*)
- The Quarterly Journal of Agriculture for April, 1859. Washington. 1 pamphlet, 8vo., pp. 88.
- EDUCATION—(*Presented by the Publishers.*)
- Ohio Journal of Education for May, 1858. 8vo., 1 pamphlet.
- DOMESTIC INDUSTRY—(*Presented by Hon. John R Bartlett.*)

—Transactions of the Rhode Island Society for the encouragement of Domestic Industry for the year 1858. Providence. 1 vol., 8vo., pp. 199.

CITY OF LAWRENCE—(*Presented by his Honor, the Mayor.*)

—Twelfth Annual Report of the Public Schools of the City of Lawrence. Lawrence, 1859. 1 pamph., 8vo., pp. 76.

—Sixth Annual Report of the Finances of the City of Lawrence. Lawrence, 1859. 1 pamph., 8vo., pp. 36.

CONGRESSIONAL DOCUMENTS—(*Presented by the Hon. J. H. Hammond, U. S. Sen.*)

—Congressional Globe, 1st Series, 35th Cong., with appendix. Washington. 4 vols., 4to.

—Reports of Explorations and Surveys for a Railroad Route from the Mississippi River to the Pacific Ocean; vol. 8. Washington. 1 vol., 4to., pp. 757.

—U. S. Naval Astronomical Expedition to the Southern Hemisphere; vol. 3. Washington. 1 vol., 4to., pp. 492.

—Message of the President and accompanying Documents, 1857-'58. Washington. 3 vols., 8vo., pp. 492.

—Annual Report of the Smithsonian Institution, 1857. Washington. 1 vol., 8vo., pp. 438.

—Report of the Superintendent of the Coast Survey, 1856. Washington. 1 vol., 4to., pp. 258, with charts.

VITAL STATISTICS—(*Presented by the Author.*)

—Report exhibiting the experience of the Mutual Life Insurance Company of New York. By Shepherd Homans, Esq., Actuary. New York. 1 vol., 4to., pp. 34. (This volume, of which only 100 copies were printed, is issued for private circulation only.)

BOOKS, ETC., ADDED BY PURCHASE.

Stedman's Narrative. 2 vols., 4to.

Macartney's Embassy. 2 vols., 4to.

Coxe's Travels. 2 vols., 4to.

Belcher's Last Voyages. 2 vols., 8vo.

Speed's Maps (Atlas), 1676. 1 vol., folio.

Heriot's Travels through Canada. 1 vol., 4to.

Ward's Mexico. 2 vols., 8vo.

Voyages in search of La Perouse. 2 vols., 8vo.

Herbert's Persian Monarchy. 1 vol., 4to.

Voyages de Montraye. 2 vols., folio.

Mandeville's Travels. 1 vol., 8vo.

Webster's Narrative. 2 vols., 8vo.

Bell's Geography. 6 vols., 8vo.

Burney's Voyages. 5 vols., 4to.

Page's La Plata, etc. 1 vol., 8vo.

White's Voyage. 1 vol., 4to.

- Birbeck's Letters from Illinois; 1818.
 Pinkerton's Geography. 1 vol., 8vo.
 Worcester's Gazetteer. 2 vols. 8vo.
 School Report, 1845. 1 vol., 8vo.
 Political Economy. 1 vol., 8vo.
 Force's National Calendar, 1821, '23, and '24.
 3 vols., 12mo.
 Duffrenoy and Beaumont's Voyage Metal-
 urgique en Angleterre. 1 vol., 8vo.
 Mugge's Switzerland. 2 vols., 12mo.
 Hayward's Gazetteer of New Hampshire. 1
 vol., 8vo.
 Cretuel's Gazetteer. 1 vol., 8vo.
 New York City Directories. 5 vols.
 Pamphlets. 1 vol., 8vo.
 Wilkes' Charts, etc. 13 sheets.
 Missionary Herald. 25 vols., 8vo.
 Darby's Universal Gazetteer. 1 vol., 8vo.
 Herapath's Railroad Journal. 4 vols., 4to.
 Bailey's Central America. (Map in covers.)
 Shepherd's St. Vincent. 1 vol., 8vo.
 De Roos' United States. 1 vol., 8vo.
 Fearon's America. 1 vol., 8vo.
 Palmer's North America. 1 vol., 8vo.
 Keysler's Travels. 4 vols., 8vo.
 Prince Adelbert's Travels. 2 vols., 8vo.
 Heber's Travels. 2 vols., 8vo.
 Depon's Voyages. 3 vols., 8vo.
 Mackay's Western India. 1 vol., 8vo.
 Expedition to the White Nile. 2 vols., 8vo.
 Brackenridge's Travels in South America.
 2 vols., 8vo.
 Chinese Embassy. 1 vol., 8vo.
 Selkirk's Ceylon. 1 vol., 8vo.
 De Bode's Travels. 2 vols., 8vo.
 Coxe's Columbia River. 1 vol., 8vo.
 Johnston's Travels. 2 vols., 8vo.
 Laurents' Ancient Geography. 1 vol., 8vo.
 Anson's Voyages. 1 vol., 4to.
 Tully's Tripoli. 1 vol., 4to.
 Barrow's Voyage to Cochín China. 4to.
 Chardin's Travels in the East.
 Bligh's Voyage to the South Seas. 1 vol., 4to.
 Waddington and Hanbury's Travels. 4to.
 Turner's Thibet. 1 vol., 4to.
 Kirkpatrick's Nepaul. 1 vol., 4to.
 Denham and Clapperton's Voyages. 2 vols.,
 4to.
 Ross' First Voyage. 1 vol., 4to.
 Ross' Arctic Expeditions. 2 vols., 4to.
 Perouse's Voyages. 2 vols., 4to, and folio
 Atlas.
 Shaw's Levant. 1 vol., folio.
 Lambert's Canada. 2 vols., 8vo.
 Parkinson's America. 2 vols. 8vo.
 Coulter's South America. 1 vol., 8vo.
 Stewart's Three Years in America. 2 vols.,
 8vo.
- Koster's Travels. 2 vols., 8vo.
 Lyon's Private Journal. 1 vol., 8vo.
 Hodgson's Letters on America. 1 vol., 8vo.
 Warville's Travels. 1 vol., 8vo.
 McCallum's Trinidad. 1 vol., 8vo.
 Well's Revenue of the United Kingdom. 1
 vol., 8vo.
 Talbot's Five Years in Canada. 2 vols., 8vo.
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 Gardner's South Africa. 1 vol., 8vo.
 Caille's Central Africa. 2 vols., 8vo.
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 Buckingham's Mesopotamia. 2 vols., 8vo.
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 Payne's Universal Geography. 4 vols., 8vo.
 Tracts on the East Indies. 2 vols., 8vo.
 Scot's Settlement at Darien. 1 vol., 12mo.
 Winterbottom's Chinese Empire. 1 vol., 8vo.
 Raynal's History of the East and West In-
 dies. 4 vols., 8vo.
 Morse's Gazetteer. 2 vols., 8vo.
 Hind's Solar System. 1 vol., 12mo.
 Philadelphia as It is. 1 vol., 12mo.
 Hassler's Geometry. 1 vol., 8vo.
 Pinkerton's Voyages. 17 vols., 4to.
 Bowle's Atlas. Folio.
 Whitney's Metallic Wealth of Nations. 1
 vol., 8vo.
 Census of Michigan, 1854. 1 vol., 8vo.
 Montgomery's Cotton Manufactures. 1 vol.,
 8vo.
 New York Directory, 1848. 1 vol., 8vo.
 Census of Boston, 1845. 1 vol., 8vo.
 Lavoisane's Atlas. (Phila. edit.), folio.
 Southgate's Armenia. 1 vol., 8vo.
 Heap's California, etc. 1 vol. 8vo.
 Jefferson's Notes on Virginia. 1 vol., 8vo.
 La Perouse's Voyages. (French.) 4 vols.,
 4to; and Atlas, folio.
 Salt's Abyssinia. 1 vol., 4to.
 D'Ulloa's Voyages. 2 vols. 8vo.
 Slade's Turkey, etc.
 Burnett's Theory. 2 vols., 12mo.
 Price on Annuities. 2 vols., 8vo.
 Dunham's Voyage. 1 vol., 12mo.
 Cook's Voyages. 12 vols., 4to; and Atlas,
 folio.
 Paul Kane's Wanderings. 1 vol., 8vo.
 Ellis's Madagascar. 1 vol., 8vo.
 Fankwei's Japan. 1 vol., 8vo.
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 Dwight's Travels in America. 4 vols., 8vo.
 Voyaye de le Brun. 2 vols., folio.

JOURNAL

OF THE

American Geographical and Statistical SOCIETY.

VOL. I.

OCTOBER, 1859.

No. 8.

HUMBOLDT COMMEMORATION

PROCEEDINGS.

At a meeting of the American Geographical and Statistical Society, held in the city of New York, on Thursday evening, June 2d, 1859, the Rev. JOSEPH P. THOMPSON, one of the Vice Presidents, in the Chair:

After the adoption of a motion to suspend all matters of business, the presiding Vice President rose and said—

GENTLEMEN OF THE SOCIETY,

I do not occupy this chair, in the absence of our respected and honored President, for the purpose of pronouncing a eulogy upon that illustrious name, to commemorate which you are now convened, for I have neither personal recollections to give you of the great departed, nor can I speak as a man of science concerning her most illustrious son. The personal reminiscences, and the scientific estimate appropriate to the occasion, must come from others. But we are here with a common interest. The statuette which graces this table; the portrait yonder, painted in his youth at Quito, by an artist of that city, and now in possession of Mr. Church, who has so recently illuminated for us the "Heart of the Andes;" the more recent portrait at my right, painted in Germany; and the photographs in various parts of the room—these recall to your remembrance,

if indeed you need to have recalled, those features which have been connected with the history of science for two-thirds of a century. We mourn for one whom the whole world knew.

But though I may not speak from personal recollection, nor as a man of science, I wish in one word, gentlemen of the Society, to pay my humble tribute, as one interested in the study of nature, and as a member of the profession which I represent, to the great service which *Humboldt* has rendered to us as a student, by that method of study in which he is so fine an example. He had already projected in his youth, when beginning his career as a man of science, that great work of *systemization* which he lived to complete, and which will pass down to posterity as an imperishable monument of his learning, his industry and his fame. He marked out a great plan for life, and pursued this with conscientious labor, with scrupulous method, with untiring diligence. Every student may profit by that example.

But he has a broader claim to admiration. There are names which are *international*, which not only stand upon the page of history as connected with specific events or with local interests, but are the common heritage of nations. And such is the name of Humboldt. Speak that name amid the Alps, where he be-

gan in the ardor of youth his scientific investigations, and the echo comes back from the Andes on the one hand, and from the Ural on the other; for what land or what tongue is there that does not pronounce the name of HUMBOLDT? It was his aim from the beginning of his scientific life, so to comprehend in his capacious survey all sciences in their inter-relations, as to be able to reduce these to the grand order of a system. How well he succeeded in this, the work whose name is on every lip, the name of Humboldt's *Cosmos*, well defines. It is not as a traveler merely,—it is not merely as a man of science, that the whole scientific world and the whole civilized world unite to do him homage. It is as one who labored in the great interests of science for *mankind*; for he ever kept within him a fresh and young and noble heart; and he himself bears testimony that the welfare of humanity was the crowning interest in his own mind in all his labors. This was the consummation he sought to reach, to benefit mankind; to uplift the race by the developments and arrangements of science in their own beauteous system, as subordinate to man's instruction and advantage.

But he has passed, in a serene old age, from that sphere which he so long lived to illumine with the lustre of his presence, with his genial hospitality, and with the products of his amazing research and industry. In that beautiful picture to which I have referred, in the Heart of the Andes, you see embosomed within the mountains, in the midst of tropical warmth and verdure, a peaceful lake, the ascent to which is by the Cross, and where those who have toiled up that weary way repose in security and serenity. So we hope that this great explorer, who illumined for us the Andes with the various lights of science, has ended his long and toilsome pilgrimage in some serene home within the everlasting mountains; for of what avail is all knowledge, all science, all truth, except it lead us onward and upward to that serene abode? By the vast comprehensiveness of his survey, by the accuracy of

his knowledge, by studying laws and principles with fidelity to truth, Humboldt evolved from the chaos of individual sciences that *Cosmos* of beauty, order and harmony which is the name of science for the physical creation; and so all our sciences and knowledges should be a sapphire stairway to lead us upward to that diviner *Cosmos*, where all truth, order, beauty, love, and joy, dwell forever under the perfected law and will of Him who made both nature and man, and find their harmony about His central throne.

The following letters addressed to the Domestic Corresponding Secretary were then read:*

OBSERVATORY, WASHINGTON, }
Thursday, May 26, 1859. }

MY DEAR SIR,—It would be to me a precious source of satisfaction to accept your invitation to be present next Thursday evening in the halls of the American Geographical and Statistical Society, and there unite with its fellows in their tribute to the great, the good, the most admirable of associates, the illustrious ALEXANDER VON HUMBOLDT, but circumstances that I cannot control compel me to forego the melancholy pleasure.

Baron HUMBOLDT was among scientists what our own WASHINGTON was among statesmen, upright and just, with attributes grand and lofty in their intellectual proportions; he lived a life that was beautiful in private, and publicly altogether lovely.

By that queer thing, thought, alone, he acquired sweet influences in the world, which but few men have ever lived to enjoy.

Having won these influences by patient toil as a student of nature, he used the power they gave him among men, not for self, but for the advancement of knowledge, and so rendered services in the cause of science which no man has ever surpassed.

By a word from him new fields of scientific

* Letters were subsequently received from Sir Wm. E. Logan, Provincial Geologist, Montreal, and from Mr. Bayard Taylor.

research were opened ; and upon his suggestion the most learned societies and enlightened governments made haste to occupy them with laborers. As great, important and valuable as are the contributions which he made directly to the general stock of human knowledge, it may well be questioned whether those which, simply by his influence, he induced, assisted or enabled others to procure or to make, are not manifold greater.

With unerring judgment he knew how to encourage, and when to commend. Often in the loneliness of his calling, has the "well done" of this great man cheered and encouraged the student with his speciality, the philosopher with his researches.

No one has a better right to speak upon this subject than your guest, who is excusing himself, for almost if not quite the last letter that Baron HUMBOLDT wrote was to help on a good work with a good word.

That letter is now before me—a precious heir-loom. He was just up from a sick bed when it was written ; it is scarcely legible, so aged, feeble and trembling was the hand that held the pen.

The occasion was of his own lofty impulse, but the object was the great scheme of research, in which this country has led off, touching the physics of the sea. The observers and chief laborers in this system are volunteers. Every undertaking which requires, upon a wide field, the united and untiring efforts of many men, seems, no matter how progressive, to have its vicissitudes, its periods of sunshine, its moments of gloom ; for clouds come in the brightest sky, and they will cast shadows.

So in this of the sea. Fellow-laborers began to flag in zeal. They wanted just such encouragement as no other "traveler of the age" could give. His commendation of what had been done was incentive enough for renewed exertions. He perceived this from his lofty eminence, and bestowed praise.

It was thus that this great man used his great influence ; and it was thus that the last days of his illustrious life were crowned by an

act rendered with a grace that will embalm it with the sweetest odors in the memory of all true-hearted sailors.

Who more than I have cause to mourn the loss of such a friend, and to whom would the privilege of uniting in the homage you propose to the illustrious dead be more grateful than to
Your obedient servant,

M. F. MAURY ?

CAMBRIDGE, Saturday, May 28, 1859.

SIR,—I regret exceedingly that the preparations for my approaching visit to Europe must prevent me from accepting the invitation with which your Society has honored me, and from being present on an occasion which excites my warmest sympathy.

Please accept my acknowledgments for the invitation, and believe me,

Very respectfully yours,

L. AGASSIZ.

NEW HAVEN, Wednesday, May 25, 1859.

DEAR SIR,—Your esteemed favor of May 23, addressed to my father is at hand.

My father left New Haven a few days since for an absence in Massachusetts and New Hampshire probably of a month or more. I shall communicate your letter to him. I know how cordially he would unite with your distinguished associates in bearing his testimony of respect and affection to the memory of the greatest and wisest of the scholars and scientists of this age.

Yours with high regard,

'B. SILLIMAN, JR.

NEW HAVEN, Saturday, May 28, 1859.

DEAR SIR,—I am gratified with the invitation which has been extended to me by the Geographical Society, to join in honors to the illustrious HUMBOLDT. But I am just now overburdened with duties in College and out, and doubt whether I shall be able to be present on the occasion.

Yours, respectfully,

JAMES D. DANA.

ALBANY, DUDLEY OBSERVATORY, }
Saturday, May 21, 1859. }

SIR,—Please express my warmest thanks to the Council of the American Geographical Society for their kind invitation to their meeting on June 2, commemorative of the late Alexander von Humboldt. As I not only have always had the highest veneration for this greatest of my countrymen, but as I also was honored by his special confidence during the time of my connection with the Royal Observatory at Berlin, and spent many hours with him in his study, which will never be forgotten, it would have given me the greatest satisfaction to be present at the meeting by which you intend to honor his memory, and I feel the deepest regret that my engagements will not allow me to do so, as I am obliged to leave here to-day and to return to Michigan for several weeks.

I remain, with the highest regard, yours,

F. BRUNNOW.

PHILADELPHIA, June 1st, 1859.

MY DEAR SIR,—I have the honor to acknowledge the receipt of your kind note, inviting me to be present at the meeting of the American Geographical and Statistical Society in commemoration of the late Alexander von Humboldt.

In common with all scientific students, I feel grief at the loss of one who has added so much to the progress of science, and deeply regret that we are deprived of the counsels of him, who by perceiving the intimate relations of different branches of learning, has more than any other established the basis for magnificent generalizations, which will facilitate the advance of the student of nature for all time.

I regret, therefore, that it is impossible for me to meet with your Society in expressing the last tribute of respect to this illustrious man; and the more do I feel this regret, because, to his love for science, Humboldt added a feeling which endears him to every true American—a devoted friendship for our country and our countrymen. Very sincerely,

JOHN L. LECONTE.

Boston, May 26, 1859.

DEAR SIR,—I have received your favor of yesterday, inviting me on behalf of the American Geographical and Statistical Society, to attend the meeting of the 2d of June, in commemoration of the late illustrious Baron Humboldt. It is scarcely necessary to say that I share with the whole scientific and literary world the grateful veneration with which his character is regarded. I had the happiness of making his personal acquaintance some forty years ago, and have on various occasions borne my humble testimony to his transcendent merits as a philosophical traveler and student of nature, both in detail and as one vast system. This I attempted particularly to do in an account of all the works resulting from his travels on this continent, in the *North American Review* for January, 1823. It would afford me a melancholy satisfaction to unite with the Society in doing honor to his great memory, but engagements and duties at home will prevent my going to New York next week.

EDWARD EVERETT.

TRENTON, May 31st, 1859.

DEAR SIR,—Your note of the 20th inst., inviting me to participate in a public meeting to be held on the evening of the 2d of June, commemorative of the services rendered to science by the late Alexander von Humboldt, has been duly received. I feel obliged by this kind invitation, and shall ever regret that circumstances which I cannot control render it impossible for me to be with you on an occasion of so much interest. We all feel that a great man has fallen. The genius which for so many years penetrated the mysteries of the material world; the mind which with wonderful power of comprehension grasped every branch of science, and made itself familiar with its laws and principles, has passed away from earth.

For more than half a century the labors of the illustrious deceased have benefited our race, and for a long portion of that time he has stood confessedly at the head of science in the old world. The learned of all countries looked up

to him as a superior, and rendered homage to his exalted attainments. Although spared to a remarkable age, it is comforting to know that he retained his powers and faculties until the last. He has gone to his rest, full of days and full of honor; and his name will be known and venerated in all time to come. Germany, who glories in the renown of her departed sons, will take care that the memory of Humboldt is duly honored. France has already decreed him a monument, and America will not fall behind in suitable demonstrations of respect and gratitude for his services.

It would seem indeed peculiarly fitting that this country should hold him in grateful remembrance; for although Baron von Humboldt was a Prussian by birth, and was devotedly attached to his king and his fatherland, he was a man of liberal sentiments, and took a lively interest in the progress and welfare of our Republic. Our literature; our advancement in science and the arts; our public institutions, and our growing power among the nations, were themes on which he often dwelt. He loved to speak of Henry, Bache, Maury and Kane, with other distinguished scientific men of our land, whose works, he remarked, had done so much to elevate our national character.

In addition to this, it is well known that all Americans were received by him with peculiar attention. Indeed, his kindness to them had become proverbial.

In view of these circumstances, it is gratifying to observe that our public Representative at the Prussian Court, and all our citizens who were in the capital, united in paying the last tribute of respect to his memory. They faithfully represented the feelings of the country, and are entitled to its thanks.

I am, dear sir, very respectfully,

Your obedient servant,

P. D. VROOM.

ALBANY, Monday, May 30, 1859.

DEAR SIR,—I have received your very kind invitation to attend a meeting of the American

Geographical and Statistical Society, to be held in New York on the 2d of June, in commemoration of the late Alexander von Humboldt.

I have delayed answering this invitation a day or two, in the hope that I might find the condition of my health such as to enable me to accept it, and to take such part in the proceedings of the meeting as might be assigned me. I deeply regret to say that a fresh aggravation of a chronic affection to which I am subject, will put it out of my power to be present on that interesting occasion.

It would have afforded me particular gratification to have been allowed to offer at your meeting my humble tribute to the memory of the illustrious Humboldt. Honored with his acquaintance, and I flatter myself, also with his friendly regard, manifested by many generous tokens during a frequent intercourse running through a period of more than three years, I came to entertain a most sincere affection for him, mingled with that inevitable reverence for his wonderful genius, which never failed to grow with every interview. I really do not know whether in the end, I revered or loved him most. I am sure I never entered his presence without some feeling of awe, nor left it without a new sense of personal attachment.

Humboldt had, beyond all comparison, the fullest mind I have ever encountered. How broad and deep it was the world knows. It was truly majestic in all its proportions, and in its mighty comprehension. And all its manifestations were marked with that perfect simplicity which is the characteristic of true greatness.

His disposition was peculiarly genial. Devoted as his life was to science, and to profound study, he did not withdraw himself from society. On the contrary, in the midst of systematic and unceasing toil, no man was more constantly found mingling in social circles. The chosen and loved companion of royalty, he was loyal to the slightest wish of his sovereign, sometimes—as I have known from his own lips, yet not in the way of complaint—to the very serious interruption of his plans of study, and

of scientific literary labor. At a good deal past eighty, I have often seen him going through the formalities of entertainments at the Palace without being seated for many hours together, and always cheerful and happy in thus contributing by his presence to the gratification of the King, and to the interest and dignity of these ceremonious occasions.

Humboldt loved to call himself an American. His sympathies were with his kind—with man and with freedom. And he saw in the United States, and in our institutions, an example and a promise of advance and improvement in the political condition of mankind, which he was never tired of contemplating. His kindness to Americans was proverbial. The card of many an unknown and obscure traveler, with the inscription: "I am an American citizen," presented at his door, has been a ready passport to his presence, when even a personal friend or an illustrious visitor, not offering this talismanic prestige, would be denied.

I beg to thank you heartily, and the Council you represent, for the invitation with which I am favored, and renewing the expression of my great regret at my inability to attend the proposed meeting.

I am, with great respect and regard,

Very truly yours,

D. D. BARNARD.

After the reading of the letters, the Vice President remarked—

Much as we regret the absence of the gentlemen who have favored us with these most interesting and valuable contributions to this ovation of Science to her departed patriarch, we congratulate ourselves upon the presence of gentlemen high in official station, and eminent in scientific and literary circles, some of whom have come from abroad on purpose to testify their interest in this occasion. In particular, we are happy to welcome to this platform, an intimate and long-trying friend of Humboldt, the Baron Von Gerolt, Prussian Minister at Washington, who has come from the seat of government expressly to participate in this tribute to

his illustrious friend. [Here Baron Gerolt was received by the audience with a most cordial greeting, which he gracefully acknowledged.] I am glad that he can witness such a homage from Americans to the name of one who, though ever loyal to his native land, was bound to this land, also, by associations and sympathies which made almost a second nature.

We have with us, also, one who has brought hither the stores of his native Germany to adorn the philosophic halls of one of our principal universities; a gentleman whom New York is proud to adopt as a citizen, and who has already marked his name for history by his profound and lucid treatises upon Political Ethics, and the application of moral science to Civil Liberty and Self-Government. As a personal friend of Humboldt, most competent to appreciate and analyze his character, Professor LIEBER has been invited to read a paper embodying his reminiscences of that distinguished man.

Dr. FRANCIS LIEBER, of Columbia College, read the following paper:

DR. LIEBER'S ADDRESS.

"The whole earth is the monument of illustrious men."—There are passages in the works of antiquity which, to our ears and minds, have the sound and depth of inspiration. They impress themselves on our souls, and, having faded in the lapse of years, they are restored to visible letters, by corresponding occasions on the paths of our lives. Such seem to me these words of Pericles, and such the occasion which has brought us together in this place. What Pericles said in his funeral speech of the men who had fallen, not for the defense, but for the glory of Athens, seems to apply in a double sense to Alexander von Humboldt. Wherever death occurs, or is remembered, there is solemnity, nor can we wholly free ourselves even from mourning, when a revered man has left us, however full his measure of a favored life may have been. He lived so long and so large a life that generations over the whole globe have grown up familiar with his name, and we were so accustomed to it that our very intel-

lects feel a degree of discomfort at presenting to our minds the world henceforth as existing without him. There is a void without Humboldt. Yet it is one of the noblest delights for those who reflect and love to be grateful, to trace the chief components of the monument of illustrious men to their authors—to find whence came the discoveries, inventions, conceptions, institutions and endeavors of entire epochs in the field of culture, freedom and truth. Who has not enjoyed the pleasure of finding the spots on the chart of human progress where you put down your finger and say, here is Aristotle, and here again; here is Hildebrandt, here is the conquest of Constantinople traced even in the discovery of our continent, even in Descartes and Bacon; here are the causes and the effects of the University; and to trace the lines of civilization radiating in different directions, from point to point? And this delight we may enjoy when meditating on the period of which Humboldt was one of the most distinct exponents—we enjoy it even now, although he has left us but yesterday; for God allowed to him days so long that he passed into history before he passed away from among us. Humboldt died as old as Sophocles.

Many of my young friends have asked me, as their teacher, and, indeed, many other friends have repeated the question, as I conversed with them on that news which on the day of its arrival attracted more interest than the accompanying advice that the contest in the plains of Italy would soon begin—was he not the greatest man of the century?

I do not believe it is fit for man to seat himself on the bench in the chancery of humanity, and there to pronounce this one or that one the greatest man. If all men were counted together, each one of whom has been called in his turn, the greatest of all, there would be a crowd of greatest men. Mortals ourselves, we should call no one the greatest. History is abstemious even in attributing simple greatness. But if it is an attribute of greatness to impress an indelible stamp on the collective mind of a race, and to give a new im-

pulse to its intellect; if greatness, in part, consists in devising that which is good, large and noble, and in perseveringly executing it by means which in the hands of others would have been insufficient, and against obstacles which would have been insurmountable to others; if it is great to graft new branches on the trees of science and culture, leading the sap to form henceforth choicer fruit; if the daring solitude of lofty thought and loyal adhesion to its own royalty is a constituent of greatness; if lucid common sense—the health and rectitude of our intelligence which avoids, in all directions, the Too-Much, is a requisite of greatness; if rare and varied gifts, such as mark distinction when singly granted, showered by Providence on one man; and if modest amenity, gracing these gifts and encouraging kindness to every one of every nation, that proved earnestness in his pursuit, whether he had chosen nature or society, the hieroglyphics or the liberty of America, the sea and the winds, or the languages, astronomy or industry, geography or history; if, in addition, an organizing mind, a power of evoking activity in the sluggish; if sagacity and unbroken industry through a life lengthened far beyond that which the psalmist ascribes to a long human existence; if a good fame encircling the globe on its own pinions long before it is carried on by later history; and if the conquests made in the realm of knowledge, so brilliant that they were not dimmed by the victories gained by the captain of the same period, who numbered the same years—if this makes up or proves greatness, then indeed we may say without presumption that one of the great men has been our own, one who was so favored an exemplar of humanity that he would cease to be an example for us, had he not manifested through his whole life of ninety years that unceasing labor, unvarying love of truth and advancement, and that kindness to his fellow-beings which are duties, and in which every one of us ought to strive to imitate him.

Courage, modesty, calmness and will—the multiplier of every energy—noble aims, te-

nacity, disregard of wealth, and an adaptive pliability distinguished him through life. He sacrificed his fortune to his enterprise in South America, declining high appointments in the State, which were proffered to him even then, and to the publication of his costly works. The last letter which he wrote to a friend before sailing to our southern continent, contains these words: "Man must will the Good and the Great; the rest comes as decreed." When early in this century the Russian Government invited him to travel in Asia, as he had traveled in America, he accepted the liberal offer, although the war with Napoleon prevented its execution; and in his letter to the Russian Minister of Finances he says: "I shall go from Tobolsk to Comorin, even if I knew that out of nine persons only one should arrive." In another portion of the letter we find these words: "I shall make myself Russian, as I made myself Spaniard in America." When he delivered that memorable and long course of lectures in Berlin, which foreshadowed his *Cosmos*, and which was steadily attended by men and women, students, professors and men of old age, by clergymen and the King and Court, his brother William wrote to a friend: "Alexander is really a *puissance*, and has gained a new species of glory by his lectures. They are unsurpassable. He is more than ever the old one, and it is as it always was a characteristic of his, to have a reluctance, an apprehension, which he cannot get rid of, concerning this kind of public appearance."

What an amount of thinking, observing, writing, traveling and discovering he has performed, from that juvenile essay of his on the textile fabrics of the ancients, to the last line of his *Cosmos*, which reminds us of Copernicus reading the last proof-sheet on his deathbed shortly before his departure, or of Mozart, who in his darkened room directed with dying looks, the singing of a portion of that requiem which he had in part composed, conscious that his ears would never hear its pealing sounds of resurrection. Let us, one and all, young and old, symbolize by the name of Humboldt, the fact

that, however untrue assuredly the saying is that genius is labor, it is true that the necessary co-efficient of genius and of any talent is incessant diligence. We are ordained not only to eat the bread of our mouth in the sweat of our brow, but to earn in the same way the nourishing bread of the mind. This is no world of trifling; it is a world of work, and Humboldt, like the Greeks, whose intellectuality he loved to honor—whose Socrates loved to say: Arduous are all noble things—was a hard working man, far harder working than most of those who arrogate the name to themselves. He ceased to work, and to work hard, only when he laid himself down on that couch from which he rose no more.

It is not considered inappropriate, on occasions like this, to give distinctness to the picture by stating personal reminiscences. Indeed I am informed that they would be gladly received. Allow me, then, to relate a very simple, yet characteristic fact. I visited Humboldt at Potsdam in the year 1844, when he had reached therefore the age of seventy-five; for you know that he was born in that remarkable year of 1769, in which Cuvier was born, and Wellington, and Chateaubriand, and Napoleon—just ten years after Schiller; just twenty after Goethe. Humboldt told me at that time that he was engaged in a work which he intended to call *Cosmos*; that he was obliged chiefly to write at night, for in the morning he studied and arranged materials, or received visitors, and in the evening he was expected to be with the King from 9 o'clock to about 11. After his return from the King he was engaged in writing until one or two, and even three o'clock.*

* While this paper was printing, a volume was sent to me, which had that day arrived from Europe—Alexander von Humboldt, by H. Klencke, 3d edition, Leipzig, 1859. It so happened that the book, opened at random, presented a passage which I cannot refrain myself from giving to the American reader, however unusual it may be to append a long note to papers of this sort. What the reader will find here is, probably, unique in the records of biography:

"About thirty years ago (this was written in 1859) he regularly rose in summer at four o'clock, and received visits as early as at eight. Only eight years

All his friends said of him that he was a master in utilizing time and opportunity, whether traveling or at home; whether in society or contemplating things. Yet no one could be less inquisitive than Humboldt, or less liable to be lead away by trifles.

Humboldt, when in Berlin or Potsdam, was retained, if I may use a professional term, to join the evening circle of the King during the indicated hours. It was all, I believe, he was expected actually to perform in return for the titles, honors and revenue which he was enjoying, except that the monarch sometimes selected him as a companion on his journeys. Humboldt described to me the character of these royal evening reunions. Everything of interest, as the day brought it to notice, was there discussed. The drawing of a beautiful live-oak near Charleston, which a fair friend had made for me, was taken by Humboldt to that circle, where it attracted so much attention that he begged me to leave it; and he told me that the volume describing our aqueduct, which my friend, the author, now the President of our College, had given me at the time of its publication, and which I had then sent to Humboldt, had furnished the topic of discussion for an entire week. We collected, he said, all possible works on ancient and modern aqueducts, and compared, discussed and applied for many successive evenings. Is there, then, a royal

ago he said that, according to long experience, he could get along with four hours sleep perfectly well. But his eighty-ninth year imposes at present restrictions upon him. Humboldt now rises at half past eight o'clock; while breakfasting he reads the letters which may have arrived, and is in the habit of replying to most of them immediately; he then dresses himself with the assistance of his servant, in order to receive visits or to make some himself. At two o'clock he is in the habit of returning home, and to drive at three o'clock to the royal palace, where he generally dines. Sometimes he presents himself at the table of some friend, chiefly that of the banker Mendelssohn (a descendant of the philosopher, Moses Mendelssohn). At seven o'clock in the evening he returns home, where he reads or writes until nine o'clock. He now goes again to court or to some company, whence he is not in the habit of returning much before midnight; and only now, in the stillness of night, begins his more especial literary activity; he is engaged in his great works until three o'clock, when in summer the bright day greets him before he lies down for his short rest."

road to knowledge after all, when a Humboldt can be retained?

May I extend your supposed permission of giving personal anecdotes, provided they are of a sufficiently biographical character, such as Plutarch, perhaps, would not have disdained to record? I desire to show what interest he took in everything connected with progress. I have reason to believe that it was chiefly owing to him that the King of Prussia offered to me, not long after my visit, a chair to be created in the University of Berlin, exclusively dedicated to the Science and Art of Punishment, or to Poenology, as I had then already called this branch.* I had conversed with the monarch on the superiority of solitary confinement at labor over all the other prison systems, when he concluded the interview with these words: "I wish you would convince Mr. von Humboldt of your views. He does not entirely agree with them. I shall let him know that you will see him."

Humboldt and prison discipline sounded strange to my ears. I went, and found that he loved truth better than his own opinion or bias, and my suggestion that so comprehensive a university as that of Berlin, our common native city, ought to be honored with having the first chair of Poenology, for which it was high time to carve out a distinct branch, treating of the convict in all his phases after the act of conviction, was seized upon at once by his liberal mind. He soon carried the minister of justice along with him, and the tempting offer to which I have alluded was the consequence.

During this visit of mine to Berlin, Humboldt also urged me, after a long conversation which we had had on the trial by jury, to give my observations in a succinct paper for the King, and to indicate what glory it would be for him to give it to Prussia. When I hesitated—for such a step seemed to me very doubtful in its character, for a simple traveler, he quickly remarked: "Never mind, send it to me; I take

* In German I had given it the better name of *Strafkunde*.

it to-morrow myself to Charlottenburg. The King will carefully peruse it."

It was the naturalist Humboldt who did and said this, and said it with encouraging warmth, contrasting with that superciliousness or circumscription of thought with which, from my university days, I have occasionally heard distinguished naturalists declare that they never pay attention to "politics," never take notice of the broad stream of public affairs which courses past their observatory on the shore. Humboldt, so far as I know, has never fallen into the error of claiming an aristocratic privilege for the natural sciences, an error not uncommon in our times, nor did he view the connection between nature and man in that light which has led contemporaries of his to what may be called material predestination.

And so it was the naturalist Humboldt, of whom a friend, whose name is perhaps more interwoven with the history of our canal than that of any other citizen, except Clinton, informs me that he had the pleasure of sitting by the side of Humboldt at a royal dinner at Charlottenburg. They were almost exclusively engaged in conversing on our great canal, and that greater one which ought to unite in everlasting wedlock the sturdy Atlantic and the teeming Pacific, having now yearned for one another for centuries. Humboldt spoke with a knowledge of details and a sagacious discernment, which was surprising to my friend, well versed in all the details of these topics.

Although it has been stated by high authority that the works of Humboldt show to every one who can "read between the lines" an endeavor to present Nature in her totality unconnected with man, I cannot otherwise than state here that, on the contrary, it has ever appeared to me that this great man, studying Nature in her details, and becoming what Bacon calls her interpreting priest, he elevates himself to those heights whence he can take a comprehensive view of her in connection with Man and the movements of society, with language, economy, and exchange, institutions and

architecture, which is to man almost like the nidifying instinct to the bird. Humboldt's tendency in this respect seems to me in its sphere not wholly dissimilar to the view which his friend Ritter takes of geography in connection with history. And do we of this Society not know with what interest and critical skill he pursued historical questions? Humboldt did not only view Nature in her totality as she is; he did not only search her own history which has made her progressively that which she is, (for the conception of successive geologic eras is his); but the history of man's knowledge of Nature, the development of discoveries and the growth of geography, had an equal charm for his fine intellect. In these researches he showed the true spirit of the historian, for whom no detail is too small, and whose comprehensive mind allows no detail to lead him to historical trifling. Present him to yourselves at one time as standing on the high Andes, and his mind soaring in high circles like a sailing eagle; at another time tracing, with ant-like industry, the beautiful name of our continent to the German schoolmaster that first proposed it.

Humboldt, it would seem, could hardly be expected to stand in a different relation to the natural sciences. He was, with all his erudition and the grandeur of his knowledge, eminently a social man. I have found a passage in a paper, written by a diplomatist and highly cultivated writer, Varnhagen von Ense,* which I feel sure will be listened to with interest. Von Ense describes his sojourn in Paris in the year 1810, and says:

"In the *salons* of Metternich (at that time Austrian Ambassador near the Court of St. Cloud) I saw Humboldt only as a brilliant and admired meteor, so much so that I hardly found time to present myself to him and whisper into his ear a few of those names which gave me a right to a personal acquaintance with him. Rarely has a man enjoyed in such a degree the esteem of all, the admiration of the most oppo-

* Published in Raumer's Historical Annual, for 1845.

site parties, and the zeal of all in power to serve him. Napoleon does not love him; he knows Humboldt as a shrewd thinker, whose way of thinking and whose opinion cannot be bent; but the Emperor and his Court, and the high authorities in the State have never denied the impression which they received by the presence of this bold traveler, by the power of his knowledge and the light which seems to stream from it in every direction. The learned of all nations are proud of their high associate; all the Germans of their countryman, and all Liberals of their fellow." . . . "It has rarely been vouchsafed," continues Von Ense, "to a man in such a degree as to Humboldt to stand forth in individual independence and always equal to himself, and at one and the same time in scientific activity and in the widest social and international intercourse, in the solitude of minute inquiry, and in the almost confusing brilliancy of the society of the day; but I know of no one who, with all this, has endeavored throughout his whole life to promote the progress and welfare of our race so steadily, uniformly, and with such ample success."

So far Von Ense. This picture is doubtless true, but we ought not to recall it to our memory without remembering at the same time one of his most prominent characteristics—his simplicity and amenity so inherent in him that they were never dimmed, so far as I know, by the luster of his talents or the energy of his thought.

The most perfect image of social refinement, which I have to this day in my mind, is an early evening party at the villa of William von Humboldt, near the Lake of Tegel. Nature has not done much for that spot, but refined simplicity, courtesy and taste, easy interchange of thought and experience, gemmed with sparkling converse, men of name and women of attractive elegance and high acquirements, young and old, travelers, courtiers, artists, soldiers and students, music, works of art, green lawns, and bright flowers, shrubby and winding paths along smooth water or waving fields,

and the Spes of Thorwaldson, are the components of that scene in the midst of which the two illustrious Humboldts moved and delighted others as much as they seemed to be gratified, giving and receiving as all the others did, never condescending, never indicating a consciousness that they encouraged the timid, but showing how gladly they received additional knowledge from every one.

The fact that Humboldt was born a nobleman was unquestionably of great advantage to him, but it was of advantage to a Humboldt only, as it is undoubtedly an advantage to a man that stands up for the people's rights, to be the descendant of ancient nobility. That noble birth, that connection with the court which aided Humboldt and his brother, has prevented thousands of persons, similarly born, from becoming earnest pursuers of high objects and deep inquiry. Alexander Humboldt threw himself at an early age into the ranks of the toiling workmen in the vineyard of knowledge and remained there, with all his titles and stars, to his end, thus doing on a more limited scale, what that good founder of a republic did, who, though born a prince of the empire, became a citizen and patriot of such a type that, in the firmament of History, his name forms a double star, with the name of Washington.

Humboldt retained his freshness of mind and soul to his latest years. This was one of his greatest charms. No one, I believe, has ever heard the old man's complaint of changing times, from his lips. He never sighed for the "good old times," although he had lived through changes in institutions and opinions, of systems and language, of men, manners, and even of dress, as no other prominent man. He received the living traditions of the great circumnavigator, Cook, through Forster, Cook's companion, and lived to gather facts for his *Cosmos* from the latest reports of the geological surveys of our States; he lived when Voltaire died, and must have grown up with many French ideas floating around him, for Humboldt was a nobleman whose family lived within the atmosphere of the Berlin court; and he lived

to witness the great revolutions in literature as well in Germany as in France and England; he lived when Rousseau died (the same year when Voltaire deceased), and must have remembered, from personal observation, that homage which even monarchs paid (at a distance, it is true) to the Contrat Sociale, and he outlived by some weeks de Tocqueville. He lived through the period of the American Revolution; was a contemporary of Washington and Adams, and a friend of Jefferson. He lived through the French Revolution and the age of the classic orators of Britain. He lived through the Napoleonic era and the resuscitation of Prussia and of all Germany. He studied under Werner, with whom mineralogy begins, and knew Houty. He knew Laplace, survived Arago and Gauss, and worked with Enke. He lived with Kant, and knew Schelling and Hegel. He knew Goethe and read Heine. He read Gibbon's Decline as a work of a living author, and perused Niebuhr, and later still praised Prescott. He grew up in the Prussian monarchy according to the type of Frederic the Great, and with the fresh reminiscences of the seven years' war, and left it changed in army, school, government—in everything. He saw the beginning of the Institute of France, and lived to be considered by its associates as one of its most brilliant ornaments at its most brilliant period. He lived through the periods which distinctly mark the science of chemistry, from Lavoisier to Rose and Liebig. Humboldt was seventeen years old when the great king, perhaps the most illustrious despot of history, died so tired by the genius of his own absolutism, that we cannot forget the words of the dying king: "I am weary of ruling over slaves;" and he lived through the whole period of growing popular sentiments and habits, of constitutional demands, and revolutionary, fearful conflicts. He wore the lace and ruffle of the last century, and the more practical dress of our times. Yet no one, I repeat, ever heard from him any useless regret for what had passed and was gone. I have heard him speak with warmth of noble things and men that he had known,

but not with gloomy despair of the present or the future.

There are men here around me of honored names in those sciences which Humboldt cultivated more especially as his own. I hope they will indicate to us how he infused a new spirit into them—how he immeasurably extended them—how he added discoveries and original conceptions; but I, though allowed to worship these sciences in the *pteroia* only, and not as a consecrated priest, crave permission to say a few words even on this topic.

Some fifteen years ago Humboldt presided over the annual meeting of Naturalists, then held at Berlin. In his opening speech he chiefly discoursed on the merits of Linnæus. He knew of Linnæus as Herodotus knew of Salamis and Thermopylæ; for the life of the great Swede overlapped by some ten years that of Humboldt, and all he there said of Linne seems to me to apply to himself with far greater force and on an enlarged scale. In that speech, too, I remember, he quoted his friend Schiller. Humboldt was, in a marked manner, of a poetic temperament. He not only analyzed and thought Nature—he *felt* Nature; and what he had comprehended by thought and feeling, he rendered in glowing presentations. I do not believe that without the poetic element he would have been able to receive those living impressions of nature, and to combine what was singly received in those vivid descriptions, and in language so true and transparent that they surprise the visitor of the scenes as, generation after generation, they are examined. He had that constructive imagination—I do not speak now of inventive fancy—without which no man can be great in any branch, whether it belong to nature or to history, to statesmanship or to the region of Watt's ingenuity.

But yesterday an officer of our navy, whose profession has made him well acquainted with South America by sea and land, and with the Andes—one of the Monuments of our Illustrious Man—told me that he knew of no descriptions, or rather characteristics, so true to living

reality as Humboldt's Views of Nature, which he had perused and enjoyed on the spot.

The power of collocation and shrewdness of connection, the knowledge of detail, and the absence of a desire to perceive things according to a system, the thirst for the knowledge of the life of Nature, and the constant wish to make all of us share in the treasures of his knowledge—his lucid style, which may establish his *Cosmos* as a German classic—these seem to me to characterize Humboldt in his studies of Nature, besides all that which he has done as a professional naturalist.

Humboldt's name and life may be termed with strict propriety of language, international. He lived for many successive years in France, and the French considered him one of theirs. He read and spoke English and Italian; he spoke and wrote Spanish with ease and correctness; his many French works are written, according to the judgment of the French themselves, with purity and elegance. He moved like a Frenchman in those few Parisian circles, which under the empire still retained the charming *esprit* and courteous benevolence of the circles of the eighteenth century. Indeed Mr. Guizot, when speaking, in his *Memoirs*, of the company which was in the habit of meeting at Madame de Rumford's, the widow of Lavoisier, enumerates Lagrange, Laplace, Berthollet, Cuvier, Humboldt and Arago. Many of the friends to whom Humboldt was most attached were Frenchmen; yet this was not at the expense of patriotism, even though his long sojourn in Paris was, partly, during the period of Prussia's humiliation by the armies of Napoleon. In that discourse at Berlin, which has been alluded to, he dwells with pride on the penetrating effect which the German mind has exercised on all the physical sciences no less than in the other branches.

Humboldt was a dweller in kingly palaces—a courtier if you choose, and a son of a courtier, without a taint of servile flattery or subordination. He was rather the honored guest of royalty. He loved liberty, and considered it a necessary element of our civilization. He was a

sincere friend of substantial, institutional freedom. He thought that, with the widening of civil freedom, the knowledge and views of nature expand, and could expand only with it. But a few years ago, Humboldt, although a daily attendant upon the King, who had much at heart the support of his Prime Minister when the Liberals exerted themselves against the latter, went unostentatiously, but openly, to the poll, and voted for the Liberal candidate. The man of science, the old man, the titled friend of the King, the courtier, voted against the administration. His mind often traveled to this country, and that he loved America is sufficiently shown, were it not otherwise well known, by the singular love which the Americans bore to him. To me that little piece of news was inexpressibly touching, which simply informed us that our Minister in Berlin with the Americans now present at that city—a cluster of mourners from afar—formed part of his funeral procession—the only foreign nation thus represented.

In all the letters of Humboldt and all his sayings, we trace high plans and noble ends, the good man and comprehensive thinker, anxious to obtain the living truth of the whole—of the entirety of nature. In his simplicity and genial warmth he did what many a bold man would have hesitated to do. I was present as a young and distant listener, when at Rome, immediately after the Congress of Verona, the King of Prussia, Humboldt and Niebuhr conversed on the affairs of the day, and when the last mentioned spoke in no flattering terms of the political views and antecedents of Arago, who, it is well known, was a very advanced republican of the Gallican school, an uncompromising French democrat. Frederic William III simply eschewed republicanism, yet when Niebuhr had finished, Humboldt said, with a sweetness which I vividly remember: "Still, this monster is the dearest friend I have in France."

Humboldt had all his brother's views of the necessity of the highest university education, as well as the widest possible popular educa-

tion, and he gave impulse to many a scientific, historical or ethnological expedition, fitted out even by foreign governments, for he was considered the counselor of all.

But I cannot dwell here any longer on his versatility and manifold aptitude. It is proved by the literature of almost every branch. If we read Barth on Central Africa, we find Humboldt; if we read Say's Political Economy, we find his name; if we study the history of the nineteenth century, we find his name in the diplomacy of Prussia and France; if we read general literature, we find his name in connection with Schiller and Madame de Stael; if we look at modern maps, we find his isothermal and magnetic lines; if we consult Grim's Dictionary of the German language, we find Humboldt as authority.

That period has arrived to which Cæsar alluded in the memorable exclamation, Oh, Solon, Solon, Solon! and we are now allowed to say that Humboldt was one of the most gifted, most fortunate and most favored mortals—favored even with comeliness, with a brow so exquisitely chiseled that, irrespective of its being the symbol of lofty thought, is pleasant to look upon in his busts, as a mere beautiful thing—favored even in his name, so easily uttered by all the nations which were destined to pronounce it.

When we pray not only for the kindly fruits of the earth, but also, as we ought to do, for the kindly fruits of the mind, let us always gratefully remember that He who gives all blessed things has given to our age and to all posterity such a man as Humboldt.

Dr. LIEBER resumed his seat amid great applause.

The Vice-President next presented Judge CHARLES P. DALY as one who needs no introduction to a New York audience, nor any commendation before a Society to whose prosperity he devotes so much of his time, his means, and his counsels. Judge Daly offered the following

RESOLUTIONS:

Resolved, That in the death of Alexander von

Humboldt, this Society has lost the most illustrious name on the roll of its honorary members, and the world one of its great benefactors.

Resolved, That we do not assemble to indulge a sentiment of regret at the termination of a life which the great Author of the Universe extended beyond the ordinary limit, but to express our sense of what that life has accomplished, and of the noble example that it presented to the age which it adorned and to all future time.

Resolved, That as this continent was the field of Humboldt's earliest achievements, and the quarter of the globe to which, for forty consecutive years, his labors were devoted, it is particularly due that a public expression should be given here of the appreciation and high estimate we put upon what he has done for our hemisphere.

Resolved, That it is impossible, within the limits of a resolution, to express our sense of the extent and value of the labors of this extraordinary man. That researches, the details of which reach to a colossal magnitude, embracing scientific subjects of every variety, pursued with the most patient assiduity, subjected to the closest possible scrutiny, and unfolded with the most luminous comprehensiveness, constitute alone a vast achievement; but when to this is added the contributions made to, and the plans devised to assist and direct the labors of others, the observations set on foot and maintained in different parts of the globe; the enormous correspondence kept in connection with the interests of science, reaching in his latter years to 3,000 letters annually, and the various publications and papers not embraced in the works above enumerated, finally culminating in the preparation and completion of his *Cosmos*, he presents a spectacle of industry and acquisition unexampled in the history of mankind.

Resolved, That while before his time the natural sciences in their course of development stood isolated, it was reserved for his genius first to master them all in detail, and then, rising to

the highest pinnacle of observation, to survey them as a whole, tracing amid their infinite diversity the connection that linked one with another, and exhibiting through this mutual relation and reciprocal action, the harmony and unity that prevail throughout the universe.

Resolved, That his intellectual pre-eminence is heightened by the beauty of his private life, his disinterestedness and gentleness, his ready sympathy with and encouragement of all who sought his aid or counsel, his strong faith in the future of humanity, his manly love of liberty as an element in human progress, and the exalted point of view from which he regarded and labored for man as a being capable of and destined to still higher developments, presenting a harmony of moral and intellectual qualities befitting the true interpreter of nature and of God as manifested in his works.

Resolved, That a copy of these resolutions, to be signed by the officers of this meeting, be transmitted to the family of the illustrious deceased.

Resolved, That a Committee of three be appointed by the Chairman to select a suitable person to deliver before the Society, in the course of the following winter, an address upon the life and services of our late associate.

After the reading of the resolutions, the Vice-President remarked:

I have somewhere read in Humboldt, that those who observe countries merely by their coasts can form no adequate idea of their geological structure, and therefore it was that he undertook those vast interior explorations which have laid open to the scientific world the physical geography of two great continents. Moreover, Humboldt brought siderial observations to illustrate telluric phenomena, and combined in one harmonious system heaven, earth, air and sea. It is most fitting, therefore, that his system, which received its development, as it finds its highest illustration in this continent, should be represented by that distinguished son of American science, who has not only directed the survey of our coast but also com-

prehends the grandeur of our continent, and who has made astronomy and the higher mathematics subservient to the best practical interests of the nation. I have the honor to introduce to you Professor BACHE, of the United States' Coast Survey, who will respond to the resolutions just read:

ADDRESS OF PROF. BACHE.

I am sure that these resolutions, admirably worded as they are, will meet a ready response from all, will be carried by acclamation, and need no enforcement feeble as mine must be, or even strong as that of the orator of the evening. I came here to-night out of love to Humboldt, and respect to you. Such an occasion needs no preparation. But to appear before an intelligent audience like this, and endeavor, unused to public speaking, to make unpremeditated remarks, does require some apology, and nothing less than the command of the President of your Society to excuse it. I shall speak as words come, and out of the veneration, excessive though it may be, but one which I know you all share with me—veneration for this great, this good, emphatically the great and good man of the nineteenth century.

The sciences have been called upon to mourn, within the last few years, the loss of two of the most eminent leaders, eminent in knowledge, pre-eminent in influence—Arago and Humboldt;—both born in the last century, but both having acquired their undying reputations in this, and shedding therefore the lustre of their distinction upon it. Arago was born later (in 1786), and died earlier than Humboldt, (born in 1769,) whose life thus overlapped Arago's in both beginning and end. Through lives of great vicissitudes these two remarkable men were friends, glorying to the last in their close relations of sincere affection. The early training of neither would seem to have been intended to prepare him for the life which he was to lead—the mountaineer pupil of the polytechnic, the pioneer of war, the corsair slave interpreter, for the perpetual Secretaryship of the Academy of Sciences of Paris

the quiet student for the renowned explorer of the Cordilleras, the first man to reach the peak of Chimborazo, the traverser of the Siberian steppes. These two men were alike in many great characteristics, and as unlike in others as men of lofty aims and pursuits could be. Their reputations were acquired, as all sound scientific reputations are, from the judgment of the world of science, which was alone competent to determine the real merit of their works. Their popularity was acquired from their powers to address the reading and reflecting in intelligible language. To some men of science it is given only to pursue one branch or a few branches of knowledge, and to become truly great as discoverers in these branches. Such men must be content to advance their science without acquiring notoriety, and truly their reward is great. To others is given the power to master many branches thoroughly, and to a few not only to advance science but to diffuse it, and to these is the reward of true fame, a large reputation based upon the judgment of those who know, and a notoriety which has this judgment for its foundation. Arago and Humboldt had this fame, and while they both were capable of the minutest research, and each (especially the former) distinguished himself in several branches of science by original investigations and discoveries, both enjoyed the most wide-spread reputation and exalted influence.

Both of these men held opinions in regard to the rights of their fellow men which induced them to sympathize warmly with Americans, and when these Americans were devoted to science, their goodness towards them knew no stint. If they erred it was in too lenient a judgment of us, and in using too easily their much prized influence, and even in bestowing their freindship.

This was emphatically the case with Humboldt, who was amiable to a fault in his encouragement of Americans holding scientific positions.

It would be a grateful theme to me to follow out the parallel and contrast of these two won-

derful men, but the object of this meeting seems not to make it appropriate to do so.

When the Coast Survey, under my direction, was attacked by one of the most powerful of American politicians, then occupying the high place of Senator of the United States, these two men were foremost in repelling the attack, and in giving the weight of their names in support of the work, and of its administration. I have always felt the most ardent gratitude to them and to their American and European brethren who then came promptly to the rescue. The invitation of the Council of the Geographical Society to appear here this evening met thus a response from my heart, which made me regret exceedingly that my want of habit of public speaking would make me so unworthy a representative of American science in a meeting like the present to do honor, in words, to the memory of Humboldt. I was, however, but to raise a feeble echo voice, the address of the evening was to be delivered by one eminently worthy and able to speak on such an occasion.

It is to do honor to the memory of Humboldt that we have met. Of the man whose reputation was acquired mainly by researches on the continent of America, which thus may be said to have supplied the occasion for the man, if not the man for the occasion.

Humboldt's great work was the result of six years of travel in North and South America, of his abilities as an explorer, as a geographer and astronomer, as a hydrographer, as a meteorologist, as a geologist, as a general observer of nature, of art, of things and men. The results of these labors, chiefly worked up in ten years by the aid of the best science of the day, laid a foundation for the sound and wide-spread reputation of Humboldt. This work belongs to our century, and is one of its great illustrations. Before its claims, the earlier researches of Humboldt in geology and botany though considered as highly meritorious in their day, and the later ones in physiology, and experimental philosophy dwindle into comparative, (though truly only comparative,) insigni-

ficance, and the popular works though so great in the eyes of reflecting and reading men, seem to the votaries of science as comparatively small contributions to the extension of the great domain of science. It is no doubt true that the adoption of many of Humboldt's ideas, thrown off broadcast in this wonderful work, have made good reputations for others by merely working them over and extending them.

When the combined system of magnetic observations, from which such useful and important results have since flowed, was inaugurated in 1838, the name of Humboldt was placed at the head of the enterprise by common consent of the men of science who were urging it forward. A letter from him pointing out the objects and advantages of the "Magnetic Crusade" was considered an essential to the successful organization of an enterprise in which Europe, Asia, and America were to take a part. The success of his previous efforts in organizing a system of magnetic and meteorological observations in Russia, and the encouragement given by him to the combined observations of Gauss and his associates, prepared the way for this more extended plan of work, which has been crowned with such success, as in turn to lead to the renewed effort which is to be made during the present year. The character of Humboldt's mind was eminently co-operative. He saw clearly the fruits which might be obtained by combination of labors in the sciences of observation, and was always ready to suggest feasible plans, and to encourage well directed and even well meant undertakings.

To his powers of observation and of expression, more than to his real scientific qualities, he owes the very wide-spread and general sympathy which have constantly followed his undertakings. The *Kosmos*, from which he derives so large a portion of his popularity, and which has given him so wide-spread a reputation in the world of literature and intelligence, would never have made him as a man of science—it was the fluting, and the acanthus adorning the column, not the column supporting the edifice of his scientific reputation.

To his personal qualities also Humboldt owed much. His heart shone out in the intercourse not only with his intimate friends, but with strangers. So that no one came in personal contact with him without feeling drawn closely to him. His powers of conversation were remarkable, his command of language, of facts, his stores of observation, his recollection of scenes and persons, his memory for details and for generalities. There was a certain characteristic of adventure in his thoughts, in his remarks, and in his actions, attractive to almost every man. You realized that you were in presence of the man who in youth had explored the New World, and in maturity the Old. Whose experience contained and combined all other experiences. Who was familiar with kings, philosophers, and the people, understanding and understood by each and all, and who enjoyed without condescension companionship with you! He had seen so many freaks of the intelligence that he had learned to estimate most highly the qualities of the heart, and thus found easy access to your's.

Death seemed to have stayed his foot from striking at the door of this great and good man of this century. But it was only stayed; he has knocked. You are collected here to honor the memory of the nonagenarian. Already the citizens of many of our States, gathered at Berlin under the lead of the Representative of the Union, have followed to the grave the bier of this illustrious representative of the science of the nineteenth century, only anticipating in this, the honor to be done him by the scientific bodies of our country, and the mourning of the intelligence of America.

The Vice-President—I remarked in the opening address—and Prof. Lieber has repeated the sentiment—that the name of Humboldt was international. It is not like the names of heroes, civilians, or of merely territorial patriots and benefactors, which, however illustrious, are confined to their own sphere and time, but both in the spirit and sentiments of the man and in the scope of his labor and

teachings, the name and work of Humboldt are the common heritage of mankind. It is meet especially that the three tongues which best represent our modern civilization should unite to do him homage. The great tongue of Germany, his mother tongue, has spoken. The English tongue has also uttered the tribute of those sciences in which he was most eminent. It remains that we should hear from that other tongue, which was to Humboldt in speech, in writing, and for the service of science scarcely second to his native language. And who so worthy to speak in the name of France as he who, prompted in his youth by the genius and example of Humboldt, has wrought out the beautiful moral harmony of creation in "the Earth and Man." I am happy to introduce to you Prof. Guyot, whose accents are familiar in this room, where he has so recently illustrated the science of physical geography.

ADDRESS OF PROF. GUYOT.

MR. CHAIRMAN: If I rise before this brilliant, to me unexpected, audience, it is to obey your summons, and to redeem a pledge which I now see was very imprudently given. At this late hour, however, after so much has been said, and so well said, on the great philosopher, to honor the memory of whom we have to-day convened, I feel that I have no right to trespass upon the patience of the audience by any extended remarks. I beg leave, therefore, to call the attention only to one prominent feature of Humboldt's character and soul, which appears to me so fundamental that it is, in my view, in a great measure the secret of his success.

While I unite with all in admiring his giant intellect, his wide grasp and power of generalization, his prodigious memory, and the universality of his knowledge, all of which were the indispensable instrumentalities for the performance of the task that he so courageously undertook and so gloriously achieved, I am still more struck by that ardent, devoted, disinterested love of nature, which seems like a breath of life to pervade all his acts—by that deep feeling of reverence for truth so manifest in him, which leaves no room for selfish motives

in the pursuit of knowledge, and finds its highest reward in the possession of truth itself. Is it not, indeed, from these noble feelings, nowhere more common than in the deep and honest German soul—from these feelings, which are the life as well as the sinew of every true man of science—that flow, as from a sacred fountain, that honesty of purpose, that sincerity in the research, which prompt the student of nature both to the most scrupulous care in ascertaining the facts in their most minute details, and to those wide generalizations which alone enable him to read aright the deep and broad sense of the book of the universe, and to make this book reveal to him the magnificence and the infinite variety of the Creative Mind? Is it not the same craving and love for truth, which forbids him to stop learning as long as he feels that he has something to learn, and thus bids him constantly progress; which makes him at once thorough in his investigations, original in devising new methods and opening untrodden paths for the discovery of new laws; modest in his opinions, cautious in his statements, ever happy to receive light from others, and to acknowledge his indebtedness to them, as well as freely to impart what he has acquired; always ready to give up even a long cherished error, when recognized as such, and to help every one sincerely engaged in the sacred cause of scientific discovery?

All these virtues of the true man of science, Humboldt possessed in a high degree, while in him they were happily associated with commensurate talents. They imparted to his personality a worth far surpassing that which mere eminence of talent can bestow. In Humboldt, the heart as well as the mind—every one who came near him could not help feeling it—the whole man, was engaged in the cause of science; and that enthusiastic devotion to so high an aim secured for him, besides the admiration due to his vast labors, that reverence for his character which was so deservedly and so universally granted to him by his cotemporaries.

It is no exaggeration to say that his life was a long series of evidences given to the world

of the reality of these noble qualities of mind and heart, of his loyalty to truth, and of his entire, unselfish devotion to the progress of human knowledge.

As a young man, in the period of preparation for active life, we find him full of enthusiasm for the study of nature in all its branches, seeking diligently for knowledge from all quarters, and becoming the pupil and friend of the most distinguished naturalists of the age. He prepares himself in his native country, by original researches in geology, botany, physiology, electricity, for the gigantic investigations in foreign lands that he dreams of, and that he was to achieve in the future, and does not hesitate to give up an official, well-remunerated situation, in order to be more free to pursue his favorite studies.

When released by the death of his beloved mother of the bonds of filial duty which had kept him at home, he sells his estates, which were by no means considerable, and ready to devote all that he possesses to scientific investigations, he starts, in 1798, for Paris, the great centre of science, to secure the best instruments which could be obtained, and join some of the scientific expeditions then preparing for distant countries under the mighty impulse of the First Consul. Obstacles seem to accumulate, but his perseverance is unshaken. He leaves France and visits Spain on his way to Africa.

But encouraged by kind offers of help, the Columbus of science leaves in June, 1799, the shores of Europe, under the protection of the Spanish Government, for the colonies in tropical America, and begins that remarkable series of travels which led to the scientific discovery of the New World. Five years are spent among the burning wastes of the Orinoco, the rich solitudes of the Amazon, the deep and sultry valleys of New Granada, the elevated plateaus and lofty volcanoes of the Andes and of Mexico; five years of toil, of danger, of privation, but also of the highest enjoyment, during which he succeeded, by his untiring industry, and with the help of his faithful friend, Bonpland,

in accumulating such an amount of information and of scientific materials, that to work them out was the task of his life. Nothing escaped his watchful, inquiring, and well-practiced eye day and night he is at work, and his observations are made with such scrupulous care, and so much skill, that for accuracy they still stand unsurpassed by the subsequent observations, made with instruments more perfect than those that science could then command.

After his return to Europe, in 1804, the question before him was not only how to prepare these rich materials for publication, but how to do it best; how to give them their full value, and to derive from them, for the benefit of science, all that they could furnish. Paris offered him a reunion of distinguished savants in all departments of natural science, for discussing his observations, and an abundance of specimens in its rich collections of natural history for comparing with his own, such as he could not find elsewhere. Germany, his own country, waits for him; his tenderly-beloved and noble-minded brother and his family wait for him; his heart is with them, but his duty to science speaks; he denies himself the pleasure of such a reunion, and takes his abode in Paris. There he remains for over twenty-two years, reviewing and studying anew, patiently, and with the most scrupulous care, every branch of science, and superintending the publication, in the most splendid style, of that long series of classical works which cost him the rest of his fortune, but won for him general admiration. Anxious, above all, not to build up a hasty reputation for himself, but to advance knowledge and to secure the greatest possible perfection, he shares his rich treasures with the most eminent men in each department of science, and requesting their collaboration, takes modestly the second place, even where his own studies might have allowed him to take the first. To Cuvier and Latreille he intrusts Zoology; his friend Bonpland with himself, and afterward his German friend, Prof. Kunth, examine and describe the 4,500 species of plants that the travelers brought from the New World. Olt-

The first of these is the fact that Humboldt was a soldier in the field of science. He was always ready to help his fellow-laborers, and to urge on every plan by which new light could be obtained. His extreme readiness to co-operate in all such schemes has been justly dwelt on a moment ago, by the distinguished scientist who last addressed you, and who has a special right to speak of it.

At all times and in all positions, Humboldt gave the most signal evidences of his unflinch-

ing loyalty to the cause of universal progress. He was one of the warmest promoters of the foundation of that great University of Berlin, the glory of his native state, and of Germany. He planned that comprehensive system of magnetic and meteorological observations, and secured the co-operation of England and Russia, thanks to which that line of scientific stations extended over both hemispheres. Never was such a vast influence more faithfully, more unselfishly used for the common good. Those who have lived in Prussia know how much of that fostering protection so largely granted to universities and public instruction in general, to scientific explorations in Europe and abroad, in the most liberal spirit, by that government, was due to the generous and the elevated views that he was spreading around him. And to speak only of individuals: who has ever approached him who has not a tale of kindness to tell of him? True, he has been charged with indiscrimination in the liberal patronage that he bestowed upon so many men, young and old. But as bountiful nature spreads broadcast a superabundance of germs, thus making provision for those which are lost, Humboldt, in his unlimited kindness and sympathy for every one in whom he recognized a sincere spirit, and a true love for nature and for knowledge, was ever ready to tender him a helping hand, even if his talents were not commensurate with his good-will, knowing well that some good would grow out of his earnest efforts for the cause of humanity. [Applause.]

Well may such a man be claimed, not by one, but by all nations. As all great and good men, he belongs to mankind. Germany, the land of his birth, is proud of the just honor to possess his mortal remains; France places his image in the temple consecrated to the memory of her distinguished sons; and we in America, we pre-eminently, by Providence, the cosmopolitan people, and the people of the future, let us rear him a monument among us such as he would approve; let us honor the science that he cherished; let us faithfully and harmoniously continue the work of the exploration of this

New World that he has so well begun, by the careful methods that he taught us, and with the disinterested, truth-loving spirit, of which he gave so remarkable an example; and let this be the homage and the fit tribute of the Western Hemisphere to Alexander von Humboldt. [Applause.]

At the close of Prof. Grevor's speech, the Vice-President said—

Ladies and gentlemen—You will willingly remain to hear further of that honored patriarch who so often sat till the small hours of the night writing for our instruction. I shall make free to call, without notice, upon a gentleman whom you would not suffer me to pass over in silence. History already claims the name of Humboldt. But Americans will also claim that their own historian be the first to inscribe that name, *here and now*. I call upon the Hon. GEORGE BANCROFT.

ADDRESS OF HON. GEORGE BANCROFT.

The call upon me is most unexpected. I considered silence my duty this evening, not from a want of intense admiration for Humboldt—not from a want of affectionate reverence for his virtues and his memory—but because we have just listened to a delineation of his career from those of our men of science who have made a great name for themselves throughout the world, and are best capable to pass a fitting eulogy upon his achievements. I should think you, like myself, would have preferred to have heard his praises pronounced exclusively by them. But as the Chairman has called upon me, to continue silent would seem like an unwillingness to acknowledge my great sense of his surpassing merits. It was my fortune to have known Humboldt earlier than any one of those who have spoken to you to-night. As a young man of 20 years, I made my way from Berlin to Paris in the year 1821, taking letters from Wilhelm von Humboldt to his brother, Alexander. And, sir, you know, all of you know, what kindness he must have extended to me. To one point only shall I call your attention: his intense love of liberty. I

mann revises the computation of the astronomical and barometrical observations. No petty rivalry ever marred, even for a moment, his relations with so many co-laborers—all remained his best friends to the end.

Humboldt's desire to be true to nature, and to reproduce the vivid image of the countries that he had visited, and of the grand phenomena that he had witnessed and carefully studied, does not allow him to remain in the beaten paths. His description of the physical structure of the Andes, his profiles across the plateaus of Mexico, the tableau of the distribution of the various forms of vegetation as connected with the changes of climate produced by altitudes, are a real revelation of the vast importance of the plastic form of our continents, which was never forgotten since by science. The laws of the distribution of plants are for the first time reduced to a system, and placed on the true foundation of Climatology; and the isothermal lines invented by Humboldt to make clear these phenomena, become themselves the fertile source of new progress in Meteorology. Physical Geography assumes henceforth the scientific aspect that it now possesses, and that none more than Humboldt has contributed to it.

The circumstance that Humboldt wrote in France, and that most of his associates were French, rendered it imperative for him to make the sacrifice of his own native language. He did so. All his works are written in that clear and positive language of France, and which is pre-eminently the language of science, and which also is the most accessible to scientific men of all nations. Two of his works only make an exception; the "Views of Nature," that first outpouring of his youthful feelings, and of the vivid impression made on his enthusiastic and poetic soul by the grand nature of the tropics; and the "Cosmos," that last and supreme effort of the poet and the philosopher, in which the whole man, heart and mind, finds his highest manifestation; both of these are written in that rich German tongue, the language of the heart and the imagination, which

was the language of his youth and of his old age.

After having nearly accomplished his long task, and not before, Humboldt yielded at last to the repeated invitation of his king and of his country, and returned to Berlin. Here again we find him at work in behalf of science. A large number of his countrymen knew him by reputation more than by his writings, which were written in a foreign tongue. He consented to give, in the winter of 1827-28, an outline of his vast researches and his profound views on nature, in a course of sixty-one public lectures, which became the foundation for his "Cosmos." All classes, from the king and the nobleman, to the literary, the scientific, and the simple man of intelligence and education, were represented in the immense audiences which gathered around him, and which no hall was large enough to contain. Humboldt was at the height of his glory and popularity. And still, a few years afterward, when scarcely returned from his great journey in Siberia and Central Asia, one might have seen in the same halls of the University the modest, gray-headed philosopher, laden with honors, both from Russia and from his own royal master, listening with eagerness, among the crowd of students, to the lectures of the celebrated philologist, Boeck. What a lesson for the young men around him! He was one of them, he who addresses you this moment, and he can assure you that though he has since personally received numerous tokens of kindness on the part of that great model student, he does not value that unintended lesson as the least.

But not only was Humboldt a valiant soldier in the field of science, he was always ready to help his fellow-laborers, and to urge on every plan by which new light could be obtained. His extreme readiness to co-operate in all such schemes has been justly dwelt on a moment ago, by the distinguished scientist who last addressed you, and who has a special right to speak of it.

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At the close of Prof. GUYOT's speech, the Vice-President said—

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came at the time with: all the zeal for liberty which may be pardoned in a young man, and which I hope I may be pardoned for retaining in later years. [Applause.] It was in the time of Louis XVIII. Humboldt read with clear distinctness the character of parties—the conflicts of opinion, and he declared himself with the utmost firmness against those retroactive measures and against that retroactive policy which was ultimately so disastrous to the Bourbon line of kings. And not in France only, for greatly as he admired English statesmen and English men of science, and England, he saw also clearly how England was suffering from excessive aristocracy. I remember to this day the strong and emphatic language in which he expressed himself of the political condition of that nation at a time when reform had not yet begun its work. More than a quarter of a century afterwards I met him again in Paris. I found in him the same friend of man; the same friend of my own native country; the same lover of liberty; with the same breadth of statesmanship. He knew our continent so well, knew the relations of the United States toward every part of it, and formed his judgments respecting the gradual advancement of

the United States, with the best wishes for our prosperity and honor, and with a perfect knowledge of the influence of physical formations of the earth, of climate, and race on the desirableness of an increase of our territory. He wished, and authorized me to say, that he wished that California and all the noble tract of land which now belongs to us on the Pacific might come to us, expressing only his apprehensions of such an expansion as might interfere with the proper development of free institutions. I have never heard any one discuss the questions of our relations to Mexico and to Cuba more calmly and more candidly, or with more gentleness toward us, and with more full and perfect acquaintance with all the circumstances that would attend any further progress on our part. He was always the friend of America. [Applause.] Sir, these few words are uttered in obedience to your request; at this late hour there is no opportunity for more. I do not hold myself competent to do justice to the merits of Humboldt as a man of science; and the little I have said expresses very inadequately my veneration for his virtues as a man. [Applause.]

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DEPARTMENT OF GEOGRAPHY.

THE EXPEDITION IN SEARCH FOR SIR JOHN FRANKLIN.

As is well known, the last expedition sent out in search of Sir John Franklin and his party, under command of Captain McClintock, returned to England in September last, having been entirely successful in verifying the correctness of Dr. Rae's discoveries, and in obtaining such additional information as has completely cleared up the fate of Sir John Franklin's expedition. The narrative of Captain McClintock which is subjoined, recites in a brief, but expressive manner, the history of his expedition which has so long engaged the attention and sympathy of the civilized world:

CAPTAIN M'CLINTOCK'S NARRATIVE.

It will be remembered that the *Fox* effected her escape out of the main pack in Davis' Straits, in lat. $63\frac{1}{2}^{\circ}$ N., on the 25th of April, 1858, after a winter's ice drift of 1,194 geographical miles. The small settlement of Holsteinborg was reached on the 28th, and such very scanty supplies obtained as the place afforded.

On the 8th of May our voyage was recommenced; Godhaven and Upernavik visited, Melville Bay entered early in June, and crossed to Cape York by the 26th; here some natives were communicated with; they immediately recognized Mr. Petersen, our interpreter, formerly known to them in the Grinnell expedition, under Dr. Kane.

It was not until the 27th of July that we reached Pond's Inlet, owing to a most unusual prevalence of ice in the northern portion of Baffin's Bay, and which rendered our progress since leaving Holsteinborg one of increasing struggle. Without steam power we could have done nothing. Here only one old woman and a boy were found, but they served to pilot us up the inlet for 25 miles, when we arrived at their village. For about a week we were in constant and most interesting communication with these friendly people. Briefly, the information obtained from them was, that nothing whatever respecting the Franklin expedition had come to their knowledge, nor had any wrecks within the last 20 or 30 years reached their shores.

Leaving Pond's Inlet on the 6th of August we reached Beechy Island on the 11th, and landed a handsome marble tablet, sent on board for this purpose by Lady Franklin, bearing an appropriate inscription to the memory of our lost countrymen in the *Erebus* and *Terror*. The provisions and stores seemed in perfect order, but a small boat was much damaged from having been turned over and rolled along the beach by a storm. The roof of the house received some necessary repairs. Having embarked some coals and stores we stood in need of, and touched at Cape Hotham on the 16th, we sailed down Peel Strait for twenty-five miles on the 17th, but finding the remainder of this channel covered with unbroken ice, I determined to make

for Bellot Strait on the 19th August; examined into supplies remaining at Port Leopold, and left there a whale boat which we brought away from Capa Hotham for the purpose, so as to aid in our retreat should we be obliged eventually to abandon the *Fox*. The steam launch had been forced higher up on the beach, and somewhat damaged by the ice. Prince Regent's Inlet was unusually free from ice; but very little was seen during our run down to Brentford Bay, which we reached on the 20th of August. Bellot Strait, which communicates with the Western Sea, averages one mile in width by 17 or 18 miles in length. At this time it was filled with drift ice, but as the season advanced became perfectly clear; its shores are in many places faced with lofty granite cliffs, and some of the adjacent hills rise 1,600 feet; the tides are very strong, running six or seven knots at the springs. On the 6th September we passed through Bellot Strait without obstruction, and secured the ship to fixed ice across its western outlet. From here, until the 27th, when I deemed it necessary to retreat into winter quarters, we constantly watched the movements of the ice in the western sea or channel. In mid-channel it was broken up and drifting about; gradually the proportion of water increased, until at length the ice which intervened was reduced to three or four miles in width. But this was firmly held fast by numerous islets, and withstood the violence of the autumn gales. It was tantalizing beyond description thus to watch from day to day the free water we could not reach, and which washed the rocky shore a few miles to the southward of us?

The winter was unusually cold and stormy. Arrangements were completed during the winter for carrying out our intended plan of search. I felt it to be my duty personally to visit Marshal Island, and in so doing, purposed to complete the circuit of King William's Island.

To Lieut. Hobson I allotted the search of the western shore of Boothia to the magnetic pole, and from Gateshead Island westward to Wynniatt's furthest. Capt. Allen Young, our sailing

master, was to trace the shore of Prince of Wales' Land, from Lieut. Browne's furthest, and also to examine the coast from Bellot Strait northward, to Sir James Ross' furthest.

Early spring journeys were commenced on the 17th of Feb., 1859, by Capt. Young and myself, Capt. Young carrying his depot across to Prince of Wales' Land, while I went southward, towards the magnetic pole, in the hope of communicating with the Esquimaux, and obtaining such information as might lead us at once to the object of our search.

I was accompanied by Mr. Petersen, our interpreter, and Alex. Thompson, quartermaster. We had with us two sledges, drawn by dogs. On the 28th of February, when near Cape Victoria, we had the good fortune to meet a small party of natives, and were subsequently visited by about 45 individuals.

For four days we remained in communication with them, obtaining many relics, and the information that several years ago a ship was crushed by the ice off the north shore, off King William's Island, but that all her people landed safely, and went away to the Great Fish River, where they died. This tribe was well supplied with wood obtained, they said, from a boat left by the white men on the Great River.

We reached our vessel after 25 days' absence, in good health, but somewhat reduced by sharp marching and the unusually severe weather to which we had been exposed. For several days after starting, the mercury continued frozen.

On the 2d of April our long-projected spring journeys were commenced; Lieut. Hobson accompanied me as far as Cape Victoria, each of us had a single sledge drawn by four men, and an auxiliary sledge drawn by six dogs. This was all the force we could muster.

Before separating we saw two Esquimaux families living out upon the ice in snow huts; from them we learned that a second ship had been seen off King William's Island, and that she drifted ashore on the fall of the same year. From this ship they had obtained a vast deal of wood and iron.

I now gave Lieut. Hobson directions to search

for the wreck, and to follow up any traces he might find upon King William's Island.

Accompanied by my own party and Mr. Petersen, I marched along the east shore of King William's Island, occasionally passing deserted snow huts, but without meeting natives till the 8th of May, when off Cape Norton we arrived at a snow village containing about thirty inhabitants. They gathered about us without the slightest appearance of fear or shyness, although none had ever seen living white people before. They were most willing to communicate all their knowledge and barter all their goods, but would have stolen everything had they not been very closely watched. Many more relics of our countrymen were obtained; we could not carry away all we might have purchased. They pointed to the inlet we had crossed the day before, and told us that one day's march up it, and thence four days overland, brought them to the wreck.

None of these people had been there since 1857-8, at which time they said but little remained, their countrymen having carried away everything.

Most of our information was received from an intelligent old woman; she said it was in the fall of the year that the ship was forced ashore; many of the white men dropped by the way as they went towards the Great Fish River; but this was only known to them in the winter following, when their bodies were discovered.

They all assured us that we would find natives upon the south shore, at the Great River, and some few at the wreck; but unfortunately this was not the case. Only one family were met off Point Booth, and none at Montreal Island or any place subsequently visited.

Point Ogle, Montreal Island, and Barrow Island were searched without finding anything, except a few scraps of copper and iron in an Esquimaux hiding-place.

Recrossing the Strait to King William's Island, we continued the examination of the southern shore without success until the 24th of May, when about ten miles eastward of Cape Herschel, a bleached skeleton was found, around

which lay fragments of European clothing. Upon carefully removing the snow a small pocket-book was found, containing a few letters. These, although much decayed, may yet be deciphered. Judging from the remains of his dress, this unfortunate young man was a steward or officer's servant, and his position exactly verified the Esquimaux's assertion, that they dropped as they walked along.

On reaching Cape Herschel next day, he examined Simpson's Cairn, or rather what remains of it, which is only four feet high, and the central stones have been removed, as if by men seeking something within it. My impression at the time, and which I still retain, is that records were deposited there by the retreating crews, and subsequently removed by the natives.

After parting from me at Cape Victoria on the 28th of April, Lieut. Hobson made for Cape Felix. At a short distance westward of it he found a very large cairn, and close to it three small tents, with blankets, oil clothes, and other relics of a shooting or a magnetic station; but although the cairn was dug under, and a trench dug all round it at a distance of 10 feet, no record was discovered. A piece of blank paper folded up was found in the cairn, and two broken bottles, which may, perhaps, have contained records, lay beside it among some stones which had fallen from the top. The most interesting of the articles discovered here, including a boat's ensign, were brought away by Mr. Hobson. About two miles further to the southwest a small cairn was found, but neither records or relics obtained. About three miles north of Point Victory a second small cairn was examined, but only a broken pick-axe and empty canister found.

On the 6th of May, Lieut. Hobson pitched his tent beside a large cairn upon Mount Victory. Lying among some loose stones which had fallen from the top of this cairn, we found a small tin case containing a record, the substance of which is briefly as follows: "This cairn was built by the Franklin Expedition, upon the assumed site of Sir James Ross' pillar, which

had not been found. The *Erebus* and *Terror* spent their first winter at Beechy Island, after having ascended Wellington Channel to 72° N., and returned by the west side of Cornwallis Island. On the 12th of September, 1846, they were beset in lat. 80° 05' N., and long. 98° 23' W. Sir J. Franklin died on the 11th of June, 1847. On the 22d of April, 1848, the ships were abandoned five leagues to the N.N.W. of Point Victory, and the survivors, 105 in number, landed here under the command of Capt. Crozier." This paper was dated April 25, 1848, and upon the following day they intended to start for the Great Fish River. The total loss by deaths in the expedition up to this date was nine officers and fifteen men. A vast quantity of clothing and stores of all sorts lay strewed about, as if here every article was thrown away which could possibly be dispensed with; pick-axes, shovels, boats, cooking utensils, ironwork, rope, blocks, canvas, a dip circle, a sextant, engraved "Frederic Hornby, R.N.," a medicine chest, oars, etc.

A few miles southward, across Back Bay, a second record was found, having been deposited by Lieut. Gore and M. des Vœux in May, 1847. It afforded no additional information.

Lieut. Hobson continued his search until within a few days' march of Cape Herschell, without finding any trace of the wreck or of natives. He left full information of his important discoveries for me; therefore, when returning northward by the west shore of King William's Island, I had the advantage of knowing what had already been found.

Soon after leaving Cape Herschell the traces of natives became less numerous and less recent, and after rounding the west point of the island they ceased altogether. This shore is extremely low, and almost utterly destitute of vegetation. Numerous banks of shingle and low islets lie off it, and beyond these Victoria Strait is covered with heavy and impenetrable packed ice.

When in lat. 69° 09' N., and long. 99° 27' W., we came to a large boat, discovered by Lieut. Hobson a few days previously, as his no-

tice informed me. It appears that this boat had been intended for the ascent of the Fish River, but was abandoned apparently upon a return journey to the ships, the sledge upon which she was mounted being pointed in that direction. She measured 28 feet in length, by 7½ feet wide, was most carefully fitted, and made as light as possible, but the sledge was of solid oak, and almost as heavy as the boat.

A large quantity of clothing was found within her, also two human skeletons. One of these lay in the after part of the boat, under a pile of clothing; the other, which was much more disturbed, probably by animals, was found in the bow. Five pocket watches, a quantity of silver spoons and forks, and a few religious books, were also found, but no journals, pocket-books, or even names upon any articles of clothing. Two double-barrelled guns stood upright against the boat's side precisely as they had been placed eleven years before. One barrel in each was loaded and cocked; there was ammunition in abundance, also thirty pounds or forty pounds of chocolate, some tea and tobacco. Fuel was not wanting; a drift tree lay within one hundred yards of the boat.

Many very interesting relics were brought away by Lieutenant Hobson, and some few by myself. On the 5th of June I, reached Point Victory without having found anything further. The clothing, etc., was again examined for documents, note-books, etc., without success, a record placed in the cairn, and another buried 10 feet true north of it.

Nothing worthy of remark occurred upon my return journey to the ship, which we reached on the 19th of June, five days after Lieutenant Hobson.

The shore of King William's Island, between its north and west extremes, Capes Felix and Crozier, has not been visited by Esquimaux since the abandonment of the *Erebus* and *Terror*, as the cairns and articles lying strewed about, which are in their eyes of priceless value, remain untouched.

If the wreck still remains visible, it is probable she lies upon some of the off-lying islets

to the southward between Capes Crozier and Herschel.

On June 28, Captain Young and his party returned, having completed their portion of the search, by which the insularity of Prince of Wales' Land was determined, and the coast line intervening between the extreme points reached by Lieutenants Osborne and Browne discovered; also between Bellot Strait and Sir James Ross' furthest in 1849, at Four River Bay.

Fearing that his provisions might not last out the requisite period, Captain Young sent back four of his men, and for 40 days journeyed on through fogs and gales with but one man and the dogs, building a snow hut each night; but few men could stand so long a continuance of labor and privation, and its effect upon Capt. Young was painfully evident.

Lieutenant Hobson was unable to stand without assistance, upon his return on board; he was not in good health when he commenced his long journey, and the sudden severe exposure brought on a severe attack of scurvy, yet he most nobly completed his work; and such facts will more clearly evince the unflinching spirit with which the object of our voyage has been pursued in these detached duties than any praise of mine.

We were now, at length, all on board again. As there were some slight cases of scurvy, all our treasured resources of Burton ale, lemon juice and fresh animal food were put into requisition, so that in a short time all were restored to sound health.

During our sojourn in Port Kennedy we were twice called upon to follow a shipmate to the grave. Mr. George Brands, engineer, died of apoplexy on the 6th of November, 1858. He had been out deer shooting several hours that day, and appeared in excellent health.

On the 14th of June, 1859, Thomas Blackwell, ship's steward, died of scurvy. This man had served in two of the former searching expeditions. The summer proved a warm one; we were able to start upon our homeward voyage on the 9th of August, and although the loss of the engine-driver in 1857, and the engineer

in 1858, left us with only two stokers, yet, with their assistance, I was able to control the engines and steam the ship up to Fury Point.

For six days we lay there closely beset, when a change of wind removing the ice, our voyage was continued almost without further interruption to Godhaven in Disco, where we arrived on the 27th of August, and were received with great kindness by Mr. Orlick, Inspector of North Greenland, and the local authorities, who obligingly supplied our few wants.

The two Esquimaux dog-drivers were now discharged, and on the 1st of September we sailed for England.

From all that can be gleaned from the record paper, and the evidence afforded by the boat, and various articles of clothing and equipment discovered, it appears that the abandonment of the *Erebus* and *Terror* had been deliberately arranged, and every effort exerted during the third winter to render the traveling equipments complete.

It is much to be apprehended that disease had greatly reduced the strength of all on board, far more perhaps than they themselves were aware of.

The distance by sledge route, from the position of the ships when abandoned, to the boat is 65 geographical miles; and from the ships to Montreal Island 220 miles.

The most perfect order seems to have existed throughout.

In order to extend as much as possible the public utility of this voyage, magnetical, meteorological, and other observations, subservient to public purposes, and for which instruments were supplied through the liberality of the Royal Society, have been continually and carefully taken, and every opportunity has been embraced by the surgeon, D. Walker, M. D., of forming complete collections in all the various branches of natural history.

This report would be incomplete did I not mention the obligations I have been laid under to the companions of my voyage, both officers and men, by their zealous and unvarying support throughout.

A feeling of entire devotion to the cause, which Lady Franklin has so nobly sustained, and a firm determination to effect all that men could do, seems to have supported them through every difficulty. With less of this enthusiastic spirit, and cheerful obedience to every command, our small number—23 in all—would not have sufficed for the successful performance of so great a work.

F. L. M'CLINTOCK, Captain, R.N.,
Commanding the Final Searching Expedition.

The yacht *Fox*, R.Y.S., off the Isle of Wight,
Wednesday, Sept. 21, 1859.

NAVIGATION OF THE MISSOURI.

It has been demonstrated by the enterprise of the American Fur Company that the Missouri River is navigable for steamboats to Fort Benton, a point within 60 miles of the head-water of the Columbia, and 3,120 miles from the Mississippi. The *Chippewa* left St. Louis on the 1st June and the mouth of the Yellow Stone 3d July, and arrived at Fort Benton on the 17th July, with 130 tons of freight, consisting of Indian annuities and the outfit belonging to the Fur Company. Starting on her return, on the 18th July, she was at the mouth of White River on 2d August, and arrived at St. Louis on the 19th August, having made the voyage of 6,240 miles in 80 days. Very little trouble was experienced in ascending the river above the Yellow Stone, excepting at Douphain's Rapids, over which the steamer was hauled by line. The trip has thus demonstrated the practicability of navigating the upper river, and with greater certainty since the *Chippewa* succeeded during a low stage of water. One month earlier she would have had no difficulty at the rapids before mentioned.

SOUTH CAROLINA:

HER NATURAL RESOURCES AND AGRICULTURAL PRODUCTS, BY OSCAR M. LIEBER, STATE GEOLOGIST OF SOUTH CAROLINA.

A cursory notice of those peculiar features of South Carolina, which are connected with her agricultural and mineral wealth, will scarce-

ly fail to interest even distant readers. Under this impression, I, therefore, now beg leave to present a map, prepared for the fourth annual report on the geognostic survey of South Carolina,* on which I have represented the zones of the different agricultural productions, and the localities of different minerals of value. On a smaller map on the same plate the areas of indigenous forest growth are exhibited.

Maps of this description are capable of throwing so much light upon the occupation, habits, commerce and prospects of a people, and upon the internal and external importance of a country, that it is not unnatural to express surprise at the comparatively few and meagre contributions of the kind which our confederacy has hitherto furnished. At all events this deviation from the prescribed, or a least adopted, schedule of ordinary geognostic reports is sufficiently excusable upon the grounds of the importance of the subject.

The plate thus offered scarcely demands any very extended explanation; but still a brief communication should accompany it.

In glancing over the map, the reader will very soon be struck by the fact that, crossing the State, near the centre, in a northeasterly direction, several lines appear in close proximity, and thus divide the State into two sections. These lines are:

1. The boundary of the crystalline rocks.
2. The boundary of the pine barrens.
3. The boundary of corn as a staple.

To these we might also add as closely approximating to them:

4. The lower boundary of small grain.
5. The line above which gold occurs.

It is easily conceived that the coincidence of a number of boundary lines, of such importance in their direct connection with practical pursuits, must exert very powerful influences upon the character of the inhabitants of the two regions thus separated—an influence which is observable in the occupation, habits, thoughts, standard of education and even politics of the

* Not yet published.

two sections; for all of these are, in most instances, to a greater or less extent, the result of circumstances connected with the physical configuration of a country, its climate and natural capacities. This difference has always been acknowledged, and hence our State has in common parlance long been divided into the up-country and low country, although the separating line has never been very clearly defined.

The mineral resources of the State, inasmuch as they enjoy priority in origin, should very properly receive the same in description.

The geological survey has not yet advanced sufficiently far to enable me to offer a geological map of the entire State, but it is scarcely too early to attempt to lay down the areas of our chief mineral resources. Even there, however, we are forced to confine ourselves chiefly to those capable of exportation. The different varieties of building materials, (the superb granite of Columbia, the red sandstone of Chesterfield, etc.), soapstones, clays, marls, etc., etc., it would be next to impossible to notice with precision.

Gold is at once perceived to be our most widely distributed metal. Many of its occurrences I have, however, not deemed of sufficient importance to notice.

The chief gold regions of our State are found near the junction of the dividing line of Edgefield and Abbeville Districts with the Savannah River, (embracing the justly famous mine of Mr. Dorn); and again in the southern part of Lancaster District, extending into Chesterfield (embracing the Brewer, Hale, Blackman, Stevens' and Belk's mines and others). From the geognostic, as well as geographical features of the two regions, it is probable that they were originally connected, and that their separation is due to the denuding influences of the Saluda, Broad and Wateree Rivers and their tributaries.

Another somewhat conspicuous gold region appears on the western slope of King's Mountain in York, Spartanburgh and Union, embracing the Martin deposit mine, the Darwin Mine and others, although more prominently distinguished in North Carolina by the King's

Mountain Mine. In Union we also perceive another auriferous locality on the Pacolet, embracing the Thompson and West Mines, the Nott Mine and others, all of which are vein mines.

In the farther western portions of our State no veins have yet been profitably worked for gold, but *gravel deposits* have occasionally been opened with success. As such I would particularize the Carson Mine in Eastern Greenville and the Cheohee Mine in Northern Pickens. Still it should be remembered that deposits of this description are necessarily finite. For a while they may yield profit; but the operations must be stopped in time to avoid unnecessary outlay.

The gold veins are of very different kinds. At least three distinct types may be distinguished; but this is not the place to enter upon their description.* Suffice it therefore to say that here, as elsewhere, in none of them can the gold be profitably worked to any very extraordinary depth. One variety of veins entirely gives out in depth; another is restricted to a particular country rock, which is itself of no very remarkable diameter; and the last, though auriferous as far as any exploration as yet extends, contains the gold farther down in a shape inaccessible to the method ordinarily in vogue, while the lead or copper make their appearance.

Copper has not yet been exported by South Carolina. The Cameron Mine in Northeastern Spartanburgh, and the Mary Mine in York District, it is to be hoped will before long commence shipments of this metal. Copper is also found in Edgefield, Abbeville and Lancaster. The Cameron Mine, although at a future day it will probably be most conspicuous for its copper, is at present of more importance with regard to—

Lead. Indeed, it is the only mine in our State, which has hitherto furnished any market—

* The interested reader will find more on this subject in the writer's official reports, and in an article of his "Der Incolumit u. seine Begleiter," in Cotta's Gangstudien," vol. III. Freiberg.

able quantity of that metal. Lead, however occurs also in Pickens and Abbeville. Very small quantities have also been found in Lancaster, but the veins have not been opened and explored.

Bismuth is found at the Brewer Gold Mine in Chesterfield, but has not yet been worked.

Manganese occurs in Kings Mountain, in the shape of a pyrolusite-bearing bed of the talcose slate. As yet it has not been found in sufficient purity for export. At Mr. Dorn's mine in Abbeville, within a short distance of the gold vein, a superb body of psilomelane, associated with pyrolusite, is observable, sometimes of a width of 50 feet, and even 100, with a perfectly vertical dip. This is probably one of the finest manganese mines in the world, although now lying idle.

Iron abounds on the western slope of Kings Mountain. The most admirable magnetic, and specular ores occur there in inexhaustible quantities. The production cannot, however, compare with the quantity of material, owing to the fact that coal does not occur near it, and that the timber is becoming scarce. The ores are itabirite, specular schist, and catawbarite, which occur as true rocks, belonging to the itacolumitic system. At other points in the State, iron has occasionally been produced from limonite ores; but now all these furnaces have ceased operations, the railroads making foreign iron too cheap to admit of competition, and the maintenance of fences around the fields having consumed the timber.

Limestone appears in York, Spartanburgh, Laurens and Pickens, and, for local consumption, is worked with profit.

Kaolin is found in great variety in Edgefield District, where it is employed for porcelain and chinaware, while the—

Felspar, needed in the manufacture of the same articles, is met with in great abundance in Eastern Pickens, and in Anderson.

On the map I have, in addition to these substances, noted the marl region, traced the boundary of the metamorphic region, and the main zone of eruption of aphanites, diorites

and felsitic porphyries, since these latter rocks, and the soils which they yield, are highly important in an agricultural point of view; and, since also they influence the geognostic characters of the up-country very materially. Within the main zone of eruption, the strike of the individual dykes is northeast. On either side their strike is northwest; a feature which is not only highly interesting, but which is accompanied by local influences upon stratified rocks traversed, of no inconsiderable importance. In some places the irregularly shaped eruptive masses have intruded themselves in such a manner as to cause great variations in the otherwise uniformly northeasterly strike of the slates. The crevices produced by the upheavals are, in consequence, in such cases variable in their direction, and thus in the vicinity of these dykes the metaliferous veins do not always present their usual course, which is parallel to the axes produced by elevation and depression.

There is a considerable variety of veins in South Carolina, which may generally be distinguished with ease, owing to marked differences in the structure of the gangue, its varying admixtures, or the peculiar characteristic shape of the crevice. Some of these types are metaliferous, and others, as far as we know, entirely barren. Almost all of them occupy definite positions, or rather distinct areas, or belts, whose general direction is dependant upon our great Southern mountain chain. These belts overlap one another; but may be traced with very great accuracy. There are a few vein types which are confined to certain rocks, and which are therefore dependant upon the presence of the latter, being omitted where erosion has removed their respective countries.* A close examination over a large portion of our State established the perfectly developed succession of rocks to be from below:—gneiss or grey granite; hornblendic schist; micaceous schist; talcose schist; argillaceous schist; itacolumitic series, and limestone. To these may be

* See Report III., p. 54, where a skeleton section is given, showing the position of the vein-types.

added the red sandstone, (the same which underlies the North Carolina coal beds), and the cretaceous and tertiary formations. With regard to those enumerated above, it is scarcely necessary to remark that intercalations of other rocks may occasionally occur, without affecting the regular order of distinct varieties. Undoubtedly far too little attention has been paid in the last half century to such very generally observable regular succession of those rocks, which Naumann terms *cryptogene*, but which are more frequently spoken of as *metamorphic*. Formerly, geologists had proceeded too far in one direction; now they but too frequently go as far on the opposite. From what has been said, it is evident that denudation must influence the presence of those veins very powerfully, the position of which is restricted to a certain rock.

Before we enter upon a brief notice of the areas of cultivated plants, some remarks on those of the indigenous growth will be proper.*

We distinguish five very strongly marked areas of natural vegetation:

- I. The extreme mountain growth.
- II. The general up country growth.
- III. The pine barren region.
- IV. The low country swamp growth
- V. The littoral growth.

The extreme mountain growth is met with in Pickens and Greenville districts. This belt is characterized by the:

Hemlock, or spruce	}	<i>Abies canadensis</i> (Michaux)
pine		
Northern, or white	}	<i>Pinus strobus</i> .
pine		
Mountain laurel		<i>Rhododendron maximum</i> .
Cucumber tree.....		<i>Magnolia acuminata</i> .
Long leaved cucumber tree.....		<i>Magnolia auriculata</i> .
Rock chestnut oak ..		<i>Quercus prinus monticola</i> .

These plants follow in an increasing downward range very much as here exhibited. Thus the hemlock does not extend as far downwards as the northern pine. Farther up, in the higher mountains of North Carolina, we find also the

* For the botanical names I am indebted to Dr John Le Conte.

table mountain pine (*pinus pungens*), and the black birch (*betula lenta*), neither of which I have found in our State.

The general up-country growth presents among its characteristic trees the:

Spanish oak.....	<i>Quercus falcata</i> (Michaux).
Black walnut.....	<i>Juglans nigra</i> , "
Black oak.....	<i>Quercus tinctoria</i> , "
Chestnut.....	<i>Castanea vesca</i> , "
Scaly barked hickory.....	<i>Carya Alba</i> (Elliot).
Slippery elm.....	<i>Ulmus fulva</i> , (Michaux).
Calico bush or ivy....	<i>Kalmia latifolia</i> , "
Red cedar.....	<i>Juniperus Virginiana</i> "
Short leaved pine....	<i>Pinus taeda</i> , "

To these we may add, as more widely diffused here, than lower down the country:

Chincapin.....	<i>Castanea pumila</i> , (M.)
Hickory (common) ..	<i>Juglans (Carya) tomentosa</i> .
Red oak	<i>Quercus rubra</i> .

The pine barren zone, which commences but little above the boundary of the tertiary formation, and extends thence to the coast, wherever the soil is sufficiently sandy to favor its growth, is characterized by the long-leaved pine (*pinus palustris* (E.) *p. australis* (M.)), and a much greater abundance of black jack oaks (*quercus ferruginea*), and scrub oaks (*q. Catesbei*). The former, often designated as the round-leaved black jack, is characteristic of soil containing some little moisture, while the latter, better known as the forked-leaved black jack, prevails only on the most arid soils of all. Sycamores (*platanus occidentalis*), persimmons (*diospyros Virginiana*), red-bud trees (*cercis canadensis*), sweet gums (*liquidambar styraciflua*), sassafras, (*laurus sassafras*), water oaks, (*quercus aquatica*), and supple-jacks (*zizyphus rotundifolia*), are more abundant here than further up the country, although with some of these is it difficult to give any portion of the State the preference.

The low country swamp growth is not bounded by any lines indicative of climate as far as the area of South Carolina extends. It is peculiar to the swamps and low grounds, which ramify through the region just described. But so extensive are our swamps, and so peculiar is a large part of their vegetation, that the latter

requires to be defined separately. We find here the cypress (*cupressus disticha*), the glorious magnolia (*magnolia grandiflora*), the tupulo, (*nyssa grandidentata*), the common cane, (*arundinaria macrosperna* (M. & Y.) *Arundogigantea*), the grey or long moss (*Tillandsia usneoides*), the Spanish bayonet (*Yucca gloriosa*), the winter whortle-berry (*vaccinium arboreum*), the white bay (*magnolia glauca*), among the most striking plants of these regions. The saw-palmetto, (*chamærops serrulata*), in some cases extends up the river swamps far into the interior. I have seen it on the Savannah as high up as Abbeville district, although it is certainly one of the plants more properly belonging to

The littoral growth.—This vegetation is confined to a belt of country running parallel with the coast. The peculiar plants extend to different distances into the interior. Thus the cabbage palmetto, (*chamærops palmetto*), rarely occurs more than ten miles from salt water, while the live oak (*quercus virens*) extends as far as forty. These are the two most characteristic trees of this zone. Others, which are more or less distinctive, are the loblolly bay (*gordonia lasianthus*), the American olive, (*Olea Americana*), more abundant in Georgia than with us; Georgia bark, (*pinckneya pubens*), pond spice, (*laurus geniculata*), and gall-berry (*prinos glabra*). In addition to these the swamp growth in low grounds, and the pine barren growth in sandy places, extend over the entire littoral belt.

It must be self-evident to the reader, that a State, exhibiting so great and striking a variety in her natural vegetation, and such very decided differences in her soils, should also be enabled to present a great diversity in the agricultural pursuits of her inhabitants. No doubt this variety is increased, or, is, I would say, more strongly emphasized on account of the peculiar geographical position of South Carolina. We live in a latitude where the influences of elevation upon the climate are more decided in their effects upon vegetation, than farther north or south; so that from the mountains to the coast we have the most strongly marked terraces of

artificial vegetation. Along our seaboard we find the semi-tropical regions of long-stapled cotton and rice. Then we arrive at the boundary of the great short-stapled cotton zone, which extends up to the line of Pickens, although there along its northwestern limits the summer season is too short to permit its successful cultivation, except on new or highly fertilized lands. Near the boundary of the tertiary we find the lower margin by the belt where corn is grown for the market. Further up we arrive at the lower boundary of the small grain belt. We have, therefore, distinctly defined regions for the production of all the plants grown from the climates of the north to those verging upon the tropics. When the small size of our State is remembered, it will be admitted that few regions are so largely favored by nature. We have not yet fully developed our agricultural advantages by rendering the zones, alluded to, more precise and numerous—making them dependant both upon climate and normal differences of soil. But this will come in time. The profits of grape culture will soon turn more general attention in that direction. The increasing price of stock will before long establish its raising as another source of agricultural prosperity, and so also will it be with other matters, to which it is here unnecessary to attend.

Like other States, we still require that stability of habitation with our people, which is necessary to all permanent improvement in agriculture. It is a great misfortune to the older States that there is a West with cheap and fertile lands. But as we advance in time, as western lands increase in value and our laboring force is gradually increased, while railroads hurry the produce to market, equalizing its value over the whole country—then too more decided and lasting improvements will be made.

However these reflections will scarcely interest readers beyond our bounds, and this paper has already grown into more bulky dimensions than I had intended.

GEOL. SURV., S. C., Aug. 6, 1859.

GEOGRAPHY AND RESOURCES OF
NEBRASKA.*

Nebraska Territory, according to the Act of Congress of 30th May, 1854, is bounded on the north by the parallel of 49° north latitude; on the east by the White Earth and Missouri Rivers; on the south by the parallel of 40° north latitude, and on the west by the Rocky Mountains. Within these bounds is an area equal to 335,882 square miles.

Beginning with the main range of the Rocky Mountains on the 49th parallel, their eastern base has a direction nearly northwest and southeast—the range crossing the Missouri at the “Gate of the Mountains.” Continuing southeast, it crosses the Yellow Stone near latitude 46°, immediately south of which it forms high snow-covered peaks. The range is again broken by the *Big Horn*, and the mountains adjacent thereto receive the name of that river. The southeast terminus of the Big Horn Mountains falls off into the elevated table-land prairie, and the range probably re-appears as the *Laramie* Mountains. South of the latitude of Fort Laramie, the line of the eastern front of the mountains is nearly north and south.

The Black Hills are the most eastern portion of what has heretofore been considered a part of the great mountain region west of the Mississippi; and it is worthy of note that if a line be drawn from them to the Little Rocky Mountains on the 48th parallel, which are the most eastern portion in that latitude, this line will be parallel to the line of the main front of the mountains already traced. What is still more significant is, that if a straight line be drawn from the mouth of the Yellow Stone to the mouth of the Kansas, it will also be parallel to the before-mentioned line, and will have about an equal portion of the Missouri River on each side of it.

The eastern base of the main mountain mass is, of course, the highest of any portion of the

plains, and at Raw Hide Peak, near Fort Laramie, its elevation is about 5,500 feet, as determined by the horizontally stratified tertiary deposits; though owing to great denudation, the average height there of the plains is not so great. The plain near the 49th parallel has probably an elevation somewhat less. The lowest line of the plains is that along the Missouri; and its elevation near Bijou Hills, (a point about on the perpendicular to it from Fort Laramie), is about 2,130 feet, which does not differ materially from its height at the mouth of the Yellow Stone. The slope of all this part of the plains, (being in a direction perpendicular to the lines of equal elevation,) has therefore its line of greatest descent in a northeast direction, and north of the Niobrara; and this is the direction in which a majority of the rivers flow, till they join with the Missouri or Yellow Stone. To the south of the Niobrara the greatest slope of the plains is to the southeast, towards the Gulf of Mexico, and this is the direction pursued there by nearly all the rivers of the plains. Thus the Niobrara would seem as it were to run along the surface of a high swell or ridge. The average slope of the plains from the Missouri to the mountains makes nowhere an angle greater than one-half of a degree with the horizon.

A remarkable feature in regard to the change of slope which occurs with the course of the Niobrara, is the shortness of its tributaries; the surface drainage seeming to be *from* and not *towards* it. A result of this is the absence of the amphitheatre-like valley which rivers generally present. Through the greater portion of the middle half of its course, the observer has scarcely any indication of it till within close proximity, so completely is it hidden by the precipitous bluffs which enclose it on either side. The surface drainage, says Lt. Warren, could never have been directed along its course so as to have worn out this channel. It must have originated in a fissure in the rocks, which the waters have since enlarged and made more uniform in size, and which the soft nature of the rock would render easy of accomplishment.

* Reduced from Lt. G. K. Warren's "Explorations in Nebraska and Dakota," in the years 1855-56 and 57. Washington: 1869.

It is worthy of remark, in this connection, that the bed of the stream in long. 102° is 400 feet higher than that of the White River at the nearest point to this. White River having there cut its way entirely through the tertiary formation, flows along the cretaceous; while the bed of the Niobrara is in the miocene tertiary, the pliocene forming the bluffs. The bed of the Niobrara is also in two-thirds of its upper course, from 300 to 500 feet above the bed of the Platte River at corresponding points at the south.

In the section of the country through which the Niobrara flows, the soil is very sandy, so that whatever rain or snow falls, it sinks under the surface, so that little is lost by evaporation. This is gradually all poured into the stream by the springs in the ravines, and in this way the river is mainly supplied in the dry seasons, in which it is one of the largest streams of the territory.

The slope of the plains is a subject to which much attention has been attracted from its scientific as well as practical interest. On this point, the barometrical observations of Lt. W.'s explorations in some measure fill up the gap between those of Gov. Stevens on the north and Fremont on the south, and thus give connected levels over a very large area.

The observations upon the great tertiary formation have developed the fact, that since the close of the pliocene period, the eastern base of the mountains, which is the western limit of this formation, has been elevated from 2,000 to 3,000 feet above the eastern, and this, without there being any visible signs of upheaval, such as inclination of the strata. The only direct evidence is in the immense denudation which the tertiary has undergone, probably while this elevation was in progress, the causes of which must have been gradually exhausted, as there is at present no force at work sufficient to have effected it. The evidence goes to show that the elevation that has taken place since the close of the pliocene, has been in Nebraska remarkably uniform, and along a line in a general direction northwest and southeast, and nearly

coincident with the ranges of the mountains previously upheaved.

The Black Hills received their last violent upheaval at the same period as the Laramie Mountains, that is, at the close of the cretaceous period. The geological evidence plainly exhibits that the pliocene and miocene tertiary, south of the Shyenne, are fresh water formations; yet there are no ridges now standing to mark the northern boundary of this basin. In the present relative position of the different parts of these plains, the elevation of the pliocene tertiary formation is now so distinct, that much of the Black Hills and the cretaceous on the Shyenne, should have been covered with it. This might, however, have been the case, but all is now denuded. North of the Shyenne, the cretaceous ridges are probably sufficiently high to have separated the tertiary beds south of it, from the lignite tertiary to the north. But still it is necessary to suppose that this last elevation of the tertiary has been somewhat greater near the 42d parallel than to the north of it.

A most interesting problem could be solved in regard to these changes of level, if a locality could be found where the lignite tertiary north of the Shyenne would be in contact with the pliocene or miocene beds to the south of it; as well as the more important one of the age of the first relative to the two latter.

During the time of these changes since the formation of the pliocene tertiary, the soft sandy material of which it was composed has been crushed and separated by denuding forces, and an area of no less than 20,000 square miles, called the *Sand Hills*, has been covered with barren sand, which, blown by the wind into hills, renders this section notoriously barren, and in a measure impracticable for travel. The Niobrara River, lying on a most desirable line of communication and direct in its general course, has 100 miles of its banks obstructed with these sand hills, and the communication of this stream and the Platte greatly obstructed, and in some places entirely cut off.

From what has been said it will be seen that

the surface of Nebraska presents two great sections—one of plains, the other of mountains. The plains are composed of nearly horizontal strata of the tertiary and cretaceous formations, except in a small portion of the southeast corner where the carboniferous is developed. Though much diversified by the effect of denuding agencies, and presenting in different portions striking characteristics, yet they on the whole present a pretty uniform surface, gradually rising towards the mountains, at the base of which they attain an elevation varying from 3,000 to 5,500 feet above sea level. These plains, as determined by their geological formation, and as heretofore intimated, have three distinct portions: 1st, the pliocene and miocene tertiary; 2d, the cretaceous, and 3d, the lignite tertiary.

The *first section* extends from the southern boundary north, nearly continuous to the 44th parallel, and contains a large portion of the valleys of the Platte, Loup Fork, Niobrara and White Rivers. Here, except in the immediate valleys of the streams, which are composed of good soil naturally irrigated by springs from the bluffs or susceptible of irrigation, much of the country is sandy and unfit for cultivation. No valuable mineral or good building stone have been discovered in it. Here are to be found the Sand Hills, which occupy an area north of the Platte of not less than 20,000 square miles. These hills on the north begin between the White and Niobrara Rivers, and extend south probably beyond the Arkansas. Their height, so far as ascertained, varies from 10 to 200 feet, and in the western portion they are ranged in ridges running east and west; but in traveling they are frequently crossed, as the intermediate valleys, which are also sand, are not continuous. About the sources of Loup Fork, many of the lakes of water found in them, are impregnated with salts and unfit to drink. The present form of these hills is mainly, if not entirely due to the wind. Where grass protects the surface the sand does not drift; but if this is removed, the wind whirls the sand in the air and often excavates deep

holes. Thus it would appear that no road could be carried through this part of the territory; for should any attempt be made to grade the surface, the drifting sand would soon fill up the cuts. In this section is also to be found the *Mauvaises-Terres*, or *Bad Lands* of White River, so celebrated for their vertebrate remains. The locality to which this name has been applied is in extent about 150 miles long, in a direction northeast and southwest, and about 60 miles wide. The term was given to this section by the traders, on account of the difficulty of getting a road through a portion of it. The name, however, is an improper one to be applied to the whole of the geological formation, to which these *Bad Lands* belong; and ought not to be used except in speaking of the portion occupied by it along the middle course of the White River; and even in this part of the river's course some beautiful valleys are to be found, as beautiful as anywhere in the far west. These *Bad Lands* of the White River country have frequently been spoken of as a vast grave or sepulchre, from the amount of bones found there; and this figure of speech has somewhat tended to give a gloomy idea of the locality which it does not especially deserve, as it abounds in the most beautiful and varied forms, in endless variety, giving the most striking and pleasing effects of light and shade. It has also been described as a great depression in the plains, with the country rising like steps to the Black Hills; whereas many portions of these *Bad Lands* are higher than all the country between them and the mountains, from which the portions on White River are distant about 30 miles. The formation to which this portion belongs extends almost uninterruptedly east to the mouth of the Keya Paha, and south beyond the Platte; and an instance of the striking appearance which it sometimes makes, is exhibited in the Court-House Rock and Scott's Bluffs.

The *second section* is the cretaceous formation, forming the level country at the base of the Black Hills; the valley of the Shyenne River, and the immediate valley of the Missouri River,

from Heart River to the Big Sioux. In this section the soil is clayey; and wherever there is a sufficiency of rain, or streams, to irrigate the soil, it is productive. The great drawback to its fertility is a want of timely rains. A portion of this formation from the Big Bend to the South Shynenne is composed of black shale, and contains much saline matter, which renders the water in some places unhealthy, and adds to the sterility of the soil along the bluffs of the streams, where saline springs are common. In this section, too, there are no valuable minerals or good building stone, except that furnished by boulders.

The *third section*, or lignite tertiary, extends north and west to the British line. The want of rain, which is experienced in this area even more than in the one north of it, renders it nearly barren. Everywhere beds of lignite are to be found, sometimes of a thickness of 6 or 7 feet. The burnt appearance of the earth, along the banks of the streams, shows that in former times these beds have been on fire over large areas, and in places are entirely burnt out; and those on Powder River are said to be on fire at the present time. There is, however, every reason to believe that in places this lignite will be found of quality good enough for fuel. In this section boulders furnish the only good building stone; but here, as in all other parts of Nebraska, good clay for making brick can be found.

The carboniferous formation is developed in a small part of the south eastern portion of the prairie of Nebraska. The town of De Soto is the highest point known on the Missouri where limestone is exposed. Ascending the valley of the Platte it is found quite well developed as far as the north of the Elk Horn, where it passes beneath the bed of the river, and become overlaid with sandstone. Several small seams of coal have been found in these limestones at Bellevue and elsewhere, and in the valley of the Platte; but it is evident that though these limestones belong to the true coal measures, they hold a position above the valuable beds; nor is it probable that a single valuable seam

will be found north of the Kansas line. The coal wrought near Fort Leavenworth, in the Kansas Territory, holds a lower geological position than the limestones of southern Nebraska. The seam of very inferior lignite, near Sioux City in the cretaceous rocks, may possibly in some places furnish fuel of value, but when exposed it gives little promise of such a result. In this case, however, as well as the coal seams in the Platte, it may be, that on penetrating to the interior portions of those beds, they will improve in quality.

The section of Nebraska which is now being occupied by settlers, has fertile soil, not surpassed by any portion of the prairies of the Mississippi Valley. In this eastern section are found the fertile and wooded valley of the Elk Horn, and all the wooded parts of the Platte. In the southern portion of it good building stone is furnished by the carboniferous rocks.

After passing to the west of the 97th meridian, sandy tracts are met with, especially near the 42d parallel, upon which they have their greatest eastern extension. It is not to be assumed, however, that there are no good lands west of the meridian of 92°, for there are fertile tracts as far west as the 99th upon the borders of streams, and which contain wood enough to support settlements. But beyond this, to the mountains, the settler will have to depend for subsistence on his flocks and herds as the Indian now does on the buffalo. Good grass is generally found all over the plains, varying in quantity and quality with different localities. In this particular the plains of Nebraska differ essentially from the desert country on Green and Snake rivers west of the South Pass, where even a sufficiency of grass for animals cannot be found.

A very different condition of soil, water and building material of stone and wood exists on reaching the mountain region.

The Black Hills, or, more properly, mountains lying between the forks of the Shynenne on the 44th parallel, between the 103d and 105th meridians, cover an area of 6,000 square miles. Their bases are elevated from 2,500 to 3,500

feet, and the highest peaks are about 6,700 feet above the ocean. The different rocks composing these mountains are—

1. Metamorphosed azoic rock, including granite.
2. Lower Silurian, or Potsdam sandstone.
3. Devonian.
4. Carboniferous.
5. Permian.
6. Jurassic, and
7. Cretaceous.

All the rocks below the Silurian are igneous and metamorphic, and the stratification which they exhibit stands every where nearly vertical, with a strike varying between northeast and northwest. All the rocks, from the Silurian to the close of the cretaceous, apparently lie conformable to each other. The shape of the mass is elliptical, the direction of its major axis being north, about 20° west. On the west, the rocks dip as a whole very gently, and at a distance of five miles from the foot of the hills, the cretaceous is apparently undisturbed, though at the base, these rocks stand at an angle of 45° . The manner in which this rock lies, suggests the idea that the cretaceous probably forms a considerable portion of the elevated plateau between the Black Hills and Big Horn Mountains. The upheaved rocks form more than one-half the mountain mass, composing some very high ridges. These rocks have a much greater inclination on the east side of the mountains, and soon disappear under the cretaceous, forming a comparatively narrow belt. The east base of the mountains is from 2,000 to 3,000 feet below the western. The rocks seem also to dip much more suddenly on the south than on the north side. The strike of these upheaved strata is in almost every direction corresponding on the exterior nearly with that of the tangent to the outline of the mass, and on the interior more nearly coincident with the direction of the major axis. A result of this formation is, that the upturned rocks break off abruptly on the side towards the interior of the mass, and leave open valleys in many places between this steep slope and the gentle one which succeeds it, as the in-

terior is approached. In these valleys, the best roads are found, and one which nearly encircles the Black Hills, is known among the Indians and traders, as the Race Course, or Running Road.

The Black Mountains derive their name from the dark appearance of the pine forests by which they are covered. The highest masses in the east, at Harney's Peak, are all granitic, and, as seen at a distance, appear in the same unmistakable form as those on the Raw Hide and Laramie Peaks; the rocks standing in layers and slabs, indicating a vertical stratification. The Inyan Kara Peak is basaltic, as are also, from distant appearances, the peaks to the north known as the Bear's Lodge and Little Missouri *Buttes*. More recent volcanic action is visible at Bear's Peak, and two circular spaces to the west of this peak, now occupied by muddy lakes, indicate the existence here, in former times, of volcanic forces.

In these mountain formations, which border the great plains on the west, are to be found beautiful flowing streams, and small rich valleys, covered over with fine grass for hay, and susceptible of cultivation by means of irrigation. Fine timber for fuel and lumber, limestone and good stone for building purposes are here abundant. Gold has been found in places in paying quantities, and, without doubt, the more common and useful minerals will be discovered when more minute examinations are made.

It is exceedingly desirable that something should be done to encourage settlements in the neighborhood of Fort Laramie. The wealth of that country, says Lieut. Warren, is not properly valued. Those who live there now support themselves by trade with the Indians, which being already overdone, it is to their interest to keep others away. If the Indian title were extinguished, and the protection of the territorial government extended, there would soon spring up a settlement that would rival that of the Great Salt Lake. The Laramie river is a beautiful stream, with a fine fertile valley and there are such everywhere

along the base of the mountains. Pine timber of the finest quality is found in abundance, easy of access, and from which the finest lumber can be made; and building stone of good quality abounds. The establishment of the military post at Fort Laramie, and the constant passing of emigrants, have driven away the game, so that the Indians do not set a high value on the land, and it could be easily procured from them.

The people now on the extreme frontiers of Nebraska are near the western limits of the fertile portions of the prairie lands, and a desert space separates them from the fertile and desirable region in the western mountains. They are, as it were, on the shore of the sea, up to which population and agriculture may advance and no further. But this gives them much of the value of places along the Atlantic frontier, in view of the future settlements to be formed in the mountains, between which, and the present frontier, a most valuable trade would spring up. The western frontier has hitherto and always will be looking to the east for a market; but as soon as the wave of emigration has passed over the desert portion of the plains, to which the discoveries of gold have already given an impetus, then will the present frontier of Kansas and Nebraska become the starting point for all the products of the Mississippi Valley which the population of the mountains will require. The beneficent operations of this trade are foreshadowed in the Santa Fe trade now carried on from the western border of Missouri; and still more plainly in the impetus given to Leavenworth by its being the depot for the supply of the army in Utah. This flow of products has in the last instance been only in one direction, but when those mountains become settled, as they eventually must be, then there will be a reciprocal trade materially beneficial to both.

These settlements in the mountains can never be agricultural to the same extent as those of the Mississippi Valley, but must depend greatly upon the raising of stock. The country, however, furnishes the means of raising sufficient quantities of grain and vegetables for the use

of the inhabitants, and beautiful, healthy and desirable locations for their homes. The remarkable freedom here from sickness is one of the attractive features of the region, and will in this respect go far to recompense the settler from the more fertile valley for his loss, in the smaller amount of products that can be taken from the soil. The great want of suitable building material, which now so seriously retards the growth of the west, will not be felt in this region.

How far the fine timbers in the interior of Nebraska can be relied upon to supply settlements on the Missouri is a question as yet undecided. The pine extends along the Niobrara and its side ravines for about 120 miles, and there is nearly an equal extent of it on White River; but on both streams it is of inferior quality and difficult of access. That at the Black Hills is much better, and covers an area of about 1,500 square miles; but this is also in situations where much labor would be required in getting it out, and an Indian war would probably attend the first attempts to do so. The Niobrara, White and Shyenne rivers could be used to bring the logs to the Missouri, down which they could be rafted.

With regard to the climate of Nebraska a true indication is to be found in the character of the plants which flourish within its limits. Certain kinds, unable to survive the long periods of drought which occur, though appropriate to the latitude, are rarely to be seen, and those which flourish best are such as require little moisture, or whose roots, penetrating deep into the soil, enable them to draw a sufficiency of moisture from below. In the high prairies, where there is a good soil, the *bunch* grass abounds, but in many places is interspersed with patches of *cacti*. The bottom lands of many of the streams support no trees, except the cottonwood and willow, and some of them produce rank growths of the wild sage.

The absence of trees on all the prairie regions is another evidence of the dryness of the climate, and even in places where they are formed, as in the ravines, the excessive cold of the win-

ter winds prevents them from reaching their full development, as is proved by the dead tops of nearly all the trees which extend their branches above the level of the prairie. The prairie fires have indeed done much towards preventing the growth of trees in places adapted to them, but it is not a sufficient cause to account for the general absence of forests.

An interesting instance of the effect of the climate in the growth of trees is to be seen in the cedar, on ascending the Missouri. At the first Cedar Island, in lat. 43°, these trees grow in the bottom lands of the river, and are large and straight; those growing on the bluffs being of an inferior quality. Further up the stream the trees diminish both in size and number. The last considerable clump or grove is in the bluffs, opposite the mouth of the Little Shyenne, in about lat. 45°; and here they are exceedingly crooked and twisted. Along the Missouri and Yellow Stone, in the lignite tertiary formation, we find the cedar unable to support itself above the ground, and spreading itself over the surface, presents the appearance, on the hill sides, of grass or moss.

Grass is everywhere abundant. With regard to corn, a small variety is raised by the *Mandans*, *Rees* and *Gros-Ventres*, near the 47th parallel on the Missouri; and it is probable that this corn can be raised along the base of the mountains as far north as the 46th parallel. The entire mountain section will produce good wheat, where the land can be irrigated; and the abundance of grass for pasturage will permit of the raising of immense herds of cattle. This western portion of Nebraska may, therefore, in the future, be valuable for a people partly engaged in agriculture, but relying mainly upon the raising of stock.

Of the rivers of the Territory, the Missouri claims first attention. This great stream has generally an uniform width from the junction of the Yellow Stone to its mouth, varying from a third to half a mile, when the banks are full. In low water the width is much less, and dry bars of sand occupy portions of its bed. In the upper part of the river, where the trees do not

destroy the force of the wind, the sand is blown about in a surprising manner, and the clouds of it can be seen for many miles. Sand banks are thus formed, generally at the edges of the trees on the islands and points, and which are often raised many feet above the level of the highest floods. The force of these winds, and their constancy during certain months, especially in October, are of themselves one of the greatest obstacles to the navigation of the river.

The navigable qualities of the river are pretty uniform from the mountains to its mouth; the difference being a little more depth of water below James' River. Along the banks, the bluffs are generally clothed with various species of trees as far up as the mouth of the Platte; above which the timber is usually confined to the ravines and bottom lands. These bottoms attain a width of from 10 to 15 miles at Council Bluffs. This width is almost continuous to the mouth of James' River. Throughout this section, the edges of the banks are lined with heavy cottonwood and other trees, and fuel for steamboats is cheap and abundant. At James' River the bluffs approach so closely, that the general width of the space between is only from one to two miles all the way to the upper Big Bend, near the 48th parallel. Here again the bottom lands become wider, and preserve a width of from 3 to 6 miles, to a point about 50 miles above the Yellow Stone. In this section there is also an abundance of large cottonwood timber, and the appearance of the river is quite similar to that presented at Sioux City. The portion of the river most deficient in wood is that between the mouths of the Little Shyenne and Cannon Ball rivers; but even here, there is an abundance for the purposes of navigation for years to come.

Another great obstruction to navigation, is the great number of *snags*, or trees, whose roots, imbedded in the channel, stand at various inclinations down the stream. These obstructions are comparatively rare above the mouth of James' River, but from this point down, they are so extremely numerous that boats are compelled to lay up, during the night, and thus

occasion a loss of nearly one-half of their running time. These and adverse winds delay steamers for days. The effect of the wind is much more seriously felt above Council Bluffs, for the protection afforded by the trees on the banks is less, and is constantly diminishing.

The examinations of Lieut. W.'s party extended only sixty miles above the Yellow Stone. The portion of the river above that point, however, was thoroughly examined by Gov. Stevens in 1853. From these examinations it has been ascertained that the river is navigable in its best stages for light draught boats to Fort Benton, about 2,600 miles from its mouth, and it is the opinion of Lt. W. that notwithstanding the difficulties to navigation which exist, that the Missouri is superior to any river in this country, except that portion of the Mississippi below their junction. The navigation is generally closed, by ice, at Sioux City, by the 10th November, and at Fort Leavenworth by the 1st December. The rainy season commences in different years, between May 15th and June 30th, and lasts about two months. During this period the tributaries of the Missouri maintain it in good boating stage. The flows produced by the melting snows come from the Platte, Big Shyenne, Yellow Stone, and the Missouri above the Yellow Stone, and reach the lower river about the first part of July, and it is mainly to these that the navigation of the Missouri above the Niobrara depends.

The American Fur Company's boats are of the largest class of freight boats now navigating the Missouri. They carry from 150 to 200 tons to the Yellow Stone, 1,900 miles, drawing from 3 to 3½ feet of water, and making the passage up in from 22 to 35 days. Considerable freight is taken out for the post of Fort Union, and they generally ascend with the portion destined for Fort Benton, to about 60 miles above the Yellow Stone, and have on one occasion gone to Milk River, 100 miles further. The freight is now taken on board of Mackinac boats, and cordeled by hand, aided generally by sails. These boats are from 60 to 70 feet long, drawing 15 to 18 inches, but 20 to 24

inches could be used. The time from Fort Union to Fort Benton varies from 40 to 80 days, depending on various causes, of which the wind is the most important. The river distance from Milk River to Fort Benton is 500 miles.

The Yellow Stone enters the Missouri near Fort Union. For the first hundred miles above its mouth the bottom lands are nearly all on the left bank; and the first 40 miles, are from 4 to 5 miles wide, with beautiful, soft, rounded bluffs to the west. The banks are clothed with large cottonwood trees, and the country presents one of the finest locations for a military post, and an Indian reservation, anywhere to be found. Beyond, the bluffs on the left bound the approach almost to the water's edge, the bottoms are narrowed, and the timber smaller and more scanty. A good route for wagons, however, exists on this side for 100 miles above the mouth. Beyond this point, the route becomes obstructed by impracticable bluffs, barely permitting the passage of pack mules. To pass around them with wagons without crossing the Yellow Stone, a detour has to be made into the prairie, consuming one or two days. Bluffs similar to these exist on the right bank all the way from the mouth to this point, but here the river suddenly changes its position in the valley, so as to leave the open space on the right bank.

This point is also the highest in the reach of navigation for steamboats, and those even of very light draught cannot, except at high water, ascend higher than 50 miles from its mouth, as the channel is much cut up by wooded islands, and obstructed by sand bars. At the head of steam navigation, ledges of rock show themselves in the bed of the streams, and about one-half mile below Powder River, a dangerous rapid, called by Captain Clarke, *Wolf Rapid*, is encountered. Two miles above the Powder River, Captain Clarke describes another serious interruption, in Bear Rapid, and 20 miles above this another which he calls Buffalo Shoal, "the most difficult part of the Yellow Stone River." All these rapids are passed every year by the

Mackinac boats of the Fur Company on their way to Fort Alexander Sarpy, and there are probably no obstacles sufficient to prevent them from reaching the point where this river debouches from the mountains. The valley all the way to the mountains is said to be practicable for wagons. Above this point the river is much enclosed by mountains, which are rugged and difficult, and covered with pine forests. From Fort Union to Fort Alexander Sarpy, the boats are from 50 to 60 feet long, drawing 15 to 20 inches water, and make the distance, 225 miles, in from 15 to 30 days.

None of the tributaries of the Yellow Stone, (Clark's Fork, Big Horn, Tongue, and Powder Rivers,) above their mouths, have ever been visited, except by trappers and hunters. Big Horn is the most important of these, and has been navigated by traders in skin boats, carrying peltries from the point where it debouches from the Big Horn Mountains, to the main river, a distance of perhaps 150 miles. Powder River rises near the southern point of the same mountains, and flows a little east of north. A route from the Platte, (at Red Buttes,) to the Yellow Stone along the stream is practicable; but, as a route for wagons, it is difficult, requiring the stream to be frequently crossed. Its banks are very muddy, and the bed in places is quicksand.

The Little Missouri River rises in the northern part of the upheaved stratified rocks of the Black Hills, and has a general northeast course through the great lignite region, to the Missouri. Sir G. Gore's party traveled up this river in 1856, and hence it is inferred that a wagon route along its border is practicable, though it may be difficult. The valley is one of the great buffalo regions. The Knife Heart, Cannon Ball, Grand and Moreau rivers all rise in the prairie ridge, east of the Little Missouri, but contain little water, except in the rainy season. The Big Shyenne is an important stream, and has its extreme sources west of the Black Hills, which its two main constituents enclose. These are supplied by numerous streams from the mountains, and unite in long.

102° 20', the river reaching the Missouri in lat. 44° 48'. In its lower course there is fertile land on its banks, and also to a large extent in and around the Black Hills. Lumber can, probably, be floated down this river, and the streams that flow into it. The Missouri, at the mouth of the Shyenne, is in the centre of the Dakota country, and along its valley we have the shortest and best route by which to reach their strongholds. Bad River, (Wakpa Spicha, or Teton,) receives its name from the unpalatableness of its waters in low stages, and the difficulty of traveling along it in wet weather. It lies throughout in the black shale bed of the cretaceous formation. It is along the sources of its northern tributary that the road from Fort Pierre to Fort Laramie is located. White River, (Mankisita Wakpa) has generally an open, well-wooded valley, with a fine soil and luxuriant grass. The road between Forts Laramie and Pierre follows the valley from its source to the Bad Lands, where the river enters a difficult section, bounded with precipices, like those on the Niobrara. The Bad Lands extend continuously down the stream to the South Fork, a distance of about 70 miles. Below this the river winds through a handsome, well-wooded valley to the Missouri. It has numerous branches, the largest of which is the South Fork. The pine in this river is nearly equal in extent to that on the Niobrara. This stream has been used by the traders to float down their peltries by means of skin-boats from their former trading house, near Butte Cache, and can also be used to raft down the pine lumber on the South Fork.

The Niobrara is a river about 350 miles long. From its source, in long. 103° 15', it is a beautiful clear stream, 10 to 15 feet wide, gradually widening, until, in long. 102° 30', it attains a width of 60 to 80 yards. All this distance its valley is well grassed, quite open and easy of travel. Here, however, it enters high steep banks, and for a long way it is a complete canon; but wood now becomes more plentiful, and pine is occasionally seen on the bluffs. In long. 101° 45', the sand hills close in on the

north bank, while on the south, they are two miles distant, leaving a smooth road to travel along the bluffs. The bluffs gradually appear higher and higher above the stream, as it descends until they reach the height of 300 feet. The sand mostly ceases on the north side in long. $100^{\circ} 23'$, but it lies close to the stream in the south, nearly all the way to the Wazihonska. Throughout this section, lying between 102° and $99^{\circ} 20'$, it flows between high rocky banks of soft white and yellowish calcareous and silicious sandstone, standing often in precipices at the water's edge, its verticality being preserved by a capping of hard grit. It is here impossible to travel any considerable distance along its immediate banks without having frequently to climb the ridges which rise sometimes perpendicularly from the stream. The channel appears to have resulted from a fissure in the earth's crust, and now flows at a depth of 300 feet below the general level, and on approaching it, its existence is only heralded by the trees which overtop the enclosing bluffs. The soft rock, which forms the bluffs, is worn into the most intricate labrynth by the small streams; and in the small deep valleys thus formed, the grass is luxuriant, and pine, ash and oak abundant. To the agriculturist, however, this section has comparatively little attraction. That between long. $99^{\circ} 20'$ and its mouth, an extent of about 90 miles, is perhaps far more valuable. Here the bottoms will probably average a width of a quarter of a mile, are susceptible of cultivation, and cottonwood, oak, walnut and ash abound. The principal tributaries of Niobrara, (which are described at length by Lt. W.,) are the Turtle Hill River (Keya-Paha Wakpa), the largest, and perhaps 120 miles long; Little Rapid River, (Mini-chaduza-Wakpa,) about 50 miles long, and forming the eastern border of the sand hills, and a number of minor streams from the northwest. Entering from the south, streams are numerous, but only three of any size, being at most only 35 miles long. The bluffs along nearly all of these are well wooded. The Ponka River, which has a very fine, well wooded, and fertile

valley, runs into the Missouri, about five miles north of the Niobrara, in lat. $42^{\circ} 48'$.

The Platte, or Nebraska, is the most important tributary of the Missouri in the region under consideration, and its broad and grass covered valley, leading to the west, furnishes one of the best wagon roads of its length in America. From its mouth to the forks the bluffs are from two to five miles from the water, making an intermediate bottom of from 4 to 8 miles wide. From the forks to Fort Laramie they occasionally come down to the water's edge, and the road has to cross the points of the ridges, and from Ash Hollow to the Fort the road is sometimes heavy with sand. Fine cottonwood grows along the banks, and on the islands from the mouth to Fort Kearny, but higher up it is scarce and of small size. Cedar is found in the ravines of the bluffs at the forks and above. The river is about a mile wide, and flows over a sandy bottom. When the banks are full, it is about 6 feet deep throughout, having a remarkable level bed; but it is of no use to navigation as the bed is so broad that water seldom attains sufficient depth, and then the rise is of short duration.

The streams of the prairies of Nebraska, below the Yellow Stone, flowing into the Missouri, are none of them navigable to any reliable extent; and, as most of them run from west to east, their greatest practical value is in affording the land route of communication between the two great sections of the Union. These valleys, indeed, furnish the only routes by which to traverse the intervening desert, for here only are such supplies of water to be found as are required, and here, too, is the only soil that can be cultivated, and such scanty supply of wood as the region produces.

Of all these river valleys, that of the Platte undoubtedly furnishes the best route for any kind of road, westward; and the best point of starting is the vicinity of Omaha City. An appropriation of \$50,000 has already been expended in bridges, etc., on the eastern portion of it, and the only important improvement remaining to make it far superior to any route on

the south side of the Platte is the establishment of a good crossing at Loup Fork, either by bridge or ferry, both of which are difficult: the first on account of the width of the stream (1,000 yards), and the latter on account of the shoals and shifting sand bars. The ford is bad by reason of quicksands. No improvement in the west would be of greater value to the emigrant or to military operations; and this once done, the route would not only be the shortest, in this latitude, from the Missouri to the mountains, but would not throughout have a serious obstacle all the way to the South Pass. Any route that takes the south side of the river has the South Fork, (which is as difficult a stream as Loup Fork,) to cross at a point where bridging it or establishing a ferry is as this time impracticable. The value of Omaha City as a starting point, as before recommended, is predicated on the improvements being made of the crossing of Loup Fork. At present Nebraska City is a point presenting almost the shortest a road. A considerable distance of river transportation would also be saved to stores brought from St. Louis, by selecting Nebraska City; and, besides, this city must always be a superior point from which to supply Fort Kearny. The distance from Nebraska City to Fort Laramie, by the proposed improved route, is about 525 miles; from Fort Leavenworth to the same point it is 645 miles.

The first place which apparently offers a superior route to the last named is the neighborhood of Fort Randall. The distance to Fort Laramie is about 380 miles. There are two reasons, however, why this advantage in distance is not practically attainable—first, Fort Randall as a depot for supplies is not to be compared with Nebraska City; and, second, the greater difficulties of the route from Fort Randall west. That it is practicable to take wagons along the Niobrara has been already shown. The route east to Sioux City might be used for the hauling of supplies from the settlements of Iowa. This route, and that by the Niobrara, would indeed seem to be the most direct one by which to continue the mili-

tary road from Mendota to the mouth of the Big Sioux, and westward to the South Pass. But the great difficulties of the Niobrara route, and the impracticability of any between it and the Platte, determined Lt. W. to advise its location direct from Sioux City to the mouth of Loup Fork, and the road this way, and thence along the Platte Valley, will be only about 40 miles longer than by the way of the Niobrara.

The next point on the Missouri which claims attention, as one from which to supply Fort Laramie, is the vicinity of old Fort Lookout. A route from this point should keep north of the White River, and intersect the present road from Fort Pierre to Fort Laramie. Except for about 30 miles through the Bad Lands, the line is excellent, and, with little improvement, would be equal to the corresponding part of the Fort Pierre and Laramie route.

The route west of this would then be the excellent one along the White Valley, at the head of which, however, there is a difficult section of about 12 miles, which needs considerable improvement. This route would be about 360 miles long, and deserves especial consideration as being the proper continuation of the route located between the Missouri and Fort Ripley, with the design of being continued to the South Pass.

The route from Fort Pierre to Fort Laramie is one that has long been in use, and is about 323 miles long. As settlement advances up the Missouri and Nebraska, and Iowa and Dakota become populated, this route or the one starting from Fort Lookout will claim attention.

At Fort Pierre the navigable portion of the Missouri is at its nearest point to Laramie and the South Pass, and above it, of course, there are no competing routes for supplying this section. Neither does the nearest navigable point for steamboats on the Yellow Stone, or its tributaries, offer any route, the shorter length of which would compensate for the increased river transportation.

In considering of the best routes for supplying the interior, the present wants of the country have alone been kept in view. When the

habitable portions of Nebraska become occupied, other routes will become important from causes not now operating, and that cannot be foreseen; but, nevertheless, those which are now most important will still maintain the ascendancy from the effect of natural causes, and the structure of the country. The same routes now most used, and best adapted to the wants of military occupation, were long before used by the trader, the Indian and the buffalo, as best adapted to their wants; and when future requirements shall demand increased facilities, and railroads shall be built, then they too will be found near the main routes now traveled by the trains of the emigrant and the army.

As before stated, an irreclaimable desert of 200 to 400 miles in width separates the points capable of settlement in the east from those on the mountains in the west. Without doubt these mountain regions will yet be inhabited by civilized men, and the communication with the east will require railroads independent of an interior overland route to the Pacific. For this purpose the valley of the Platte offers a route not surpassed for natural gradients in the world, and very little more is to be done west of the Missouri than to make the superstructure. A cheap road for light trains and engines could easily be built, and when settlements are formed in the mountains such will become profitable; and the gold that has been discovered there in valuable quantities may produce this result much sooner than is anticipated. The Niobrara apparently presents the shortest and more direct route for such a road, than the Platte, but, as before stated, its natural features are less favorable. Nevertheless, the Niobrara route is not impracticable, but the difficulties in the way will overbalance the advantages it possesses in being the shorter route from the Missouri. If the route be considered as starting at Chicago, thence *via* Rock Island, Omaha and the Platte Valley, the distance is about the same as that by Dubuque, Sioux City, and the Niobrara, the one large bend which the Platte route makes at Fort Kearney being counterbalanced by the number of smaller ones of the

Niobrara route. A route for a railroad to the Pacific, from the neighborhood of St. Paul by way of the South Pass, would keep on, or near, the general course of the wagon road lately laid out to the Missouri at Fort Lookout, and thence along the north side of White River, as before indicated.

Should a route ever be required from the west shore of Lake Superior to the South Pass, it could be located on a very direct and practicable line, *via* Fort Ripley, Lake Traverse, and the Big Shyenne, and deserves examination.

But a route from Lake Superior to the South Pass would probably not compete with that examined by Gov. Stevens, near the 44th parallel. It may, however, be questionable whether one of equally as many advantages could not be found by preceding directly west from the Bois de Sioux to the Missouri at Fort Clark; thence by way of Knife River to the Yellow Stone, at the mouth of Powder River. The valley of the Yellow Stone thence offers a direct route west to the mountains, where Captain Clark crossed them, and thence near the route he pursued to the Bitter Root Valley. The more direct route would be down the valley of the Salmon River; but the information possessed of this stream indicates its character, through the mountains, to be one involving great difficulties.

The number of Indians within the limits of Nebraska, so far as enumerated by Lieut. W. would appear to be about 40,000. Of these the most numerous are the Dakotas, numbering 24,000; the Crows about 4,800, the Pawnees about 4,000, and the Chippewas, Crees and Assiniboinas, about 3,600. The chapter relating to these is full of interest, but too long for insertion, after the extended notice given to the physical and economical features of the country. For the same reason the medical report of Dr. Moffitt, and the report of Dr. Hayden on its geology and natural history, etc., are omitted.

The subject of a railroad to the Pacific, being an abridgement of the explorations made by the government to this end, will form an appropriate continuation of this report.

RUSSIANS ON THE AMOOR.

The Russian Government has recently promulgated a decree which proves the importance and development which the settlements founded on the Amoor have already attained. These settlements, according to this order, will now be formed into two provinces—the first, or “Maritime Province of Eastern Siberia,” to include the six districts of Nicolaersk, Sophusk, Ochersk, Petropolovski, Ghizika and Oudsk, and the second, or “Amoor Province,” to include all the country situated on the left bank of that river, from the confluence of the Schilka and Angame up to the confluence of the Oussouri. The latter province will have the city of Blagofestchensk for its capital, which will be the residence of its military governor and the other officials.

That the Russians have developed their Asiatic possessions with a remarkable spirit of intelligence and perseverance is now apparent. The treaty entered into about three years ago with the Court of Peking, through Gen. Mouravieff Amoorski, has given a fine territory to the nation and will open to that power the centre of China. The Amoor is formed by the union of the rivers Kheroulun and Onon. The first is considered as the principal constituent of the main stream. It takes its source in the Barka-Dabahn mountains, and separates the Chinese from the Russian Daouri. After the union of the Onon, it crosses the country of the Mantchoos, and empties itself into a gulf of the Sea of Ochotsk, opposite the island of Tarrakai.

In conformity with the decree now promulgated, the principal divisions of Asiatic Russia are modified in the following manner: Western Siberia includes the governments of Tobolsk and Tomsk and the province of Omsk, and Eastern Siberia the governments of Irkutsk, Iamaisk, Yakutsk, the Maritime Province, and that of Amoor. The trade with China, which was formerly carried on through Kiakhta, a city on the boundaries of the two empires, will in future take larger proportions and become more profitable.

The settlements on the Amoor are in an ex-

cellent condition. The military organization is perfect: it comprises regular troops and regiments of Cossacks. The maritime force is composed of a division, the ships of which have been specially constructed for the local service they have to perform. That division put in at Cherbourg last summer on its way from Cronstadt to the Chinese seas. As to Blagofestchensk it has become an important city. The buildings for the accommodation of the officials appointed by the above-mentioned decree are already erected and fit for occupation.

Latest news from Hong Kong apprises us of the fact that the Russians have also formed a settlement at Broughton, one of the cities of the Korean Archipelago which is under the sovereignty of China. These several creations prove that the Russian understands the advantage which the leading nations will at some future time derive from their Asiatic possessions.

By the treaties with China, made within the last three years, it was decided that a regular mail should be established by land between Peking and St. Petersburg. Notwithstanding the difficulties of its fulfilment, that decision did not long remain a dead letter. The Governor-General of Eastern Siberia, Count Mouravieff Amoorski, desiring to watch in person over the organization of that important service, proceeded, about the beginning of November last, to the city of Kiakhta, and despatched the first courier of the new postal line, and notwithstanding the unfavorable weather that then prevailed, he arrived at Peking on the 20th December. The Chinese Government decided that the courier should remain outside the city, but allowed the mail to be delivered, and announced that the return mail would start in a month's time, and would take charge of the letters for the road, provided that those who were to write them would submit themselves to the imperial regulations on the subject. The Russian mission at Peking punctually received its despatches, through a Chinese messenger, the day after the arrival of the courier. This is the first step in an important direction.

The mail will hereafter depart and arrive at Kiakhta monthly. The courier who goes from that city to Irkutsk, the capital of Eastern Siberia, will correspond with the courier going thence to St. Petersburg, and the whole trip from the Russian capital to Pekin and the return will, in fine weather, be made in from 78 to 80 days. The advantage of this arrangement will only be made evident when the several nations of Europe will have established official representatives in the Chinese capital, as the late treaties allow them to do.

MISSOURI IRON.

In the 1st volume of the Geological Survey of Missouri an estimate is given of the quantity of iron ore in the celebrated iron region of that State. The Iron Mountain, 228 feet high, covering 500 acres, is one mass of specular ore, weighing 230,187,275 tons, and will yield at the furnace 56 per cent, or 128,904,930 tons of pure iron. Pilot Knob, next in richness, is estimated to contain 13,972,773 tons of ore, or 7,824,752 tons of pure iron. These two deposits will furnish 136,729,682 tons of iron, the ore of which all lies above the natural surface of the country, is easy to mine, and furnishes the best of metal. Railroad iron, 70 lbs. to the yard, takes 123.2 tons to the mile, and all the railroads in the United States (30,000 miles) would take of that weight of rail about 3,696,000 tons of iron, or but a little more than a fortieth part of the whole deposit. What gives a present value to these deposits, is their connection, through the St. Louis and Iron Mountain Railroad, with the vast coal fields lying immediately above St. Louis. At that point the ore and coal are brought in contact, rendering St. Louis unsurpassed by any locality in the world for the manufacture of iron.

JUNCTION OF THE SEA OF AZOF AND THE CASPIAN.

The project of effecting a junction between the Caspian Sea and the Sea of Azof, says a letter from St. Petersburg, is now the subject of much conversation here, and will soon, it is

thought, be realized. This was a favorite scheme of Peter the Great, whose genius clearly saw the immense advantage which must accrue to Russian commerce, if this great inland sea could be connected with the Sea of Azof, and thereby with the Black Sea and the Mediterranean.

NORTHEASTERN BOUNDARY.

The entire length of the boundary line from the source of the river St. Croix to St. Regis, on the St. Lawrence, is 658 miles, 3,145 feet, bounding several States, namely: Maine, 447 miles, 3,753 feet; New Hampshire, 56 miles, 1,503 feet; Vermont, 90 miles, 2,853 feet; and New York, 64 miles, 316 feet. *Exec. Doc., No. 1, 31st Cong., 2d Sess.*

HEIGHT OF MOUNT DEMAVEND.

In the Proceedings of the Royal Geographical Society of London, No. 1, 1859, there appears a very interesting paper on an ascent of Mt. Demavend, effected by R. F. Thomson and Lord Schomberg H. Kerr, of H. B. M.'s mission in Persia. These gentlemen have set at rest the much disputed question of its elevation, and give it at 21,520 feet above the sea. Humboldt, in his *Cosmos*, states it to be 19,715 feet; and, according to the same authority, "Ararat" has an elevation of 17,112 feet.

HEIGHTS OF BOLIVIAN ANDES.

(From the Map of Col. Juan Ondarza.)

Mountains.	Spanish Feet.*
Yllampu (Sorata)	26,969
Yllimani	26,254
Sajama (Sahama)	24,907
Coololo (Apolobamba)	24,320
Huayna-Potosi	23,785
Chachacomani	23,460
Quenuata, { Tacora }	23,100
Chpicani, { in Peru, }	24,660
Mururata	22,194
Sailinsani	22,316
Potosi	17,092
Tunari de Cochabamba	16,966
Hermoso de Aullagas	17,117
Portugalete	16,000
Espejos (in Santa Cruz)	10,149
Misti (Volcano de Arequipa)	21,903

* Spanish foot=282.65 millimetres, or 11.1283 inches, or 0.9273 English foot.

DEPARTMENT OF STATISTICS.

LAKE SUPERIOR COPPER REGION.

Long anterior to the advent of Europeans, the region around Lake Superior had been occupied by an industrious race of miners. The implements of their labors found in their excavations attest the fact; but the record of their history is lost, nor have any traditions or memorials of them been preserved by the races which succeeded.

The Jesuit Fathers in the latter part of the 17th century were the earliest explorers of this region. The first mining operations within historical times were commenced in 1771 by an enterprising Briton, named Henry, at the forks of the Ontonagon; but so distant was he from inhabitants, and so wild and unsettled the country, that he was soon compelled to suspend his labors.

In 1819, General Cass, accompanied by Mr. Schoolcraft, made a journey along the southern shore of the lake to the Mississippi; and in 1823, Major Long passed on the north side on his return from a scientific expedition to the Mississippi and St. Peter's rivers. The publication of the accounts of these expeditions attracted general attention to the mining resources of the region, and established the abundance of copper, confirming fully the reports of voyageurs and trappers who had painted in the most glowing terms the mineral wealth of the region, and which for more than two centuries had excited the wonder and admiration of the civilized world.

The first definite information of this country, however, was that furnished by Douglas Houghton, State Geologist of Michigan, who, in 1841, published an account of his observations in the form of an annual report to the Legislature. This eminent man, while prosecuting further geological explorations, was unfortunately drowned, near the Eagle River, on the 13th of October, 1845. But already mining operations had been re-commenced in the region, and explorers and adventurers were flocking to it from all quarters.

The Chippeways, the Indian occupants of Northern Michigan, ceded their lands to the United States in 1842. The field was thus cleared of all obstacles to agriculture or mining. In the summer of 1843 several miners crossed over the line from Wisconsin and selected numerous mineral tracts. These selections, many of which are now occupied by the most productive mines in the country, (at first three miles square, but afterwards reduced to one mile,) were leased by the War Department to applicants, in virtue of an act of Congress, made in reference to the *lead lands* of Illinois. These leases required that the lessees should work the mines with all diligence, and render to the government six per cent. of the whole amount of the ores and metal raised.

In the season of 1844, it having become generally known that the country was open to settlement, numerous persons visited the region, and the first mining operations were commenced. Discoveries of vast masses of native copper and of veins and deposits in the rock rapidly succeeded each other; and the "copper fever" soon spread to every part of the country. In 1845, the shores of Keweenaw Point were whitened with the tents of emigrants and explorers. No less than 377 leases were issued in this year. In 1846, the excitement reached its climax—companies were formed, stocks bought and sold (many not-worth the paper on which they were printed), and the whole community was mad with the expectation of sudden wealth. But every such mania has its end. The bubble at length burst, and at the close of the year scarcely half a dozen companies, of the multitude that had been formed, were actually engaged in mining.

In 1847 (the issue of leases having been suspended in 1846 as unauthorized by law), Congress passed an act for the sale of the mineral lands, and for a geological survey of the district. The latter was entrusted to Messrs. Foster and Whitney, whose elaborate report to Congress, and the subsequent work of Mr. Whitney,* form the basis of the present ac-

* "Mineral Wealth of the United States."

count. In the meantime, while the survey was progressing, the companies at work having met with much success, new companies were formed, and the position and character of the really metalliferous rocks having been ascertained, confidence was gradually restored. On the publication of the survey and maps of the whole region in 1851, copper mining in the district had become established on a firm basis, and was receiving a rapid development.

Having thus given a sketch of the progress of events on the shores of the Great Northern lake, it will be proper to add a few words on the geological structure of this region; and the results which have been accomplished.

The basin of Lake Superior occupies for the most part a great synclinal trough. From each side of the lake the dip of the sandstone, which appears to form its bed, is towards the center. The opposite shores, sometimes 160 miles apart, however, are very different in character and appearances—the northern, with cliffs almost perpendicular and sometimes more than 1,000 feet high, presenting scenes of unrivalled grandeur; the southern comparatively low, only occasionally rising to a height exceeding 200 feet above the lake.

This difference in aspect is easily accounted for. On the east and north the sandstone has been worn away, leaving only the enduring granite and trappean rocks, which present a more stable barrier against the further encroachment of the lake. Only here and there limited patches of sedimentary rocks remain, where they are sheltered from the action of the waters, standing as outliers in small islands and along the coast, and behind Isle Royale.

The sandstone, however, appears along the entire southern shore from Sault Ste Marie to Fond du Lac, its continuity being interrupted in only a few points where the older rocks have been denuded. The trend of this shore is east and west; but about mid-distance from its extremities, its outline is broken by a projecting point of land which extends in a north-east direction for 60 or 70 miles. This is Keweenaw Point.

The sandstone of Lake Superior has been satisfactorily proved to be of the lower Silurian age, and probably the equivalent of the Potsdam sandstone, the lowest fossiliferous rock recognized in the United States. Above it from any point between the Sault and the Pictured Rocks, the upper members of the Silurian system crop out in succession, with a slight southerly dip. Along this portion of the lake shore the sandstone lies nearly horizontally, and is made up of rounded grains of quartzose sand, but slightly discolored by iron, and having but little coherence. Its thickness is from 300 to 400 feet. When it comes in contact with the azoic rocks, as near the Carp and Chocolate Rivers, it rests unconformably upon them. On Keweenaw Point, however, its disposition is entirely changed, being thicker, tilted up and associated with heavy beds of conglomerate and trap. On tracing the interior ranges, which approach the lake at the extremity of the Point, they are found to extend southwesterly a few miles distant from the lake, gradually diminishing in Wisconsin, and finally disappearing before reaching the Mississippi River.

These ranges form usually two, but sometimes three or more, parallel ridges, steep towards the south, with a moderate dip lakeward, and averaging about 500 feet in height above the lake. Along the line of elevation locally known as the "*Trap Range*," the copper mines of the southern shore are situated, the metalliferous belt occupying in Michigan a length of more than 120 miles and a breadth varying from two to six miles. In the more elevated and central portion of the range the rocks are mostly of the igneous class, intercalated with beds of conglomerate. Receding in either direction from the line of igneous action, the belts of trap become thinner, and the conglomerate predominant, and, again, the latter is succeeded by sandstone, with its normal characteristics.

There are certain varieties of trap, which are universally recognized in this region and which have a marked influence on the character of

the veins as they pass through them. These changes of character are most distinctly perceived in Isle Royale and Keweenaw Point. The two species predominant in Keweenaw Point are the amygdaloid and greenstone; only the first of which is productive. The richest veins are found in the rock which is neither too compact nor too soft and porous.

Native copper, for which this region is peculiarly noted, occurs in many veins, but usually in small masses which are found near the surface and have evidently resulted from the decomposition of the sulphurets. The veins of those rocks in which they are most productive carry exclusively *native* copper, with a small admixture of native silver, and there has been no change observed in this characteristic at any depth as yet reached. Where the trap is not distinctly bedded, it ceases to bear native metal, but contains sulphuret of copper, zinc, lead, etc. Thus in the southern range of Keweenaw Point, which appears to have been protruded at a late epoch, and to have tilted up the bedded trap and interstratified conglomerate which lies to the north, the veins bear only sulphuret, and on the north shore, where trap is most developed, they seem to be of the same imbedded character, and are traversed by the same minerals.

There are three heads under which the miners class the mineral produced, viz.: *mass*, *barrel* and *stamp*, according to the size of the pieces in which it occurs. These distinctions are also recognized in commerce. "Mass copper" is met with in veins sometimes 20 or 30 feet long; and this, having been detached by stoping away the rock, is cut up by chisels into pieces of such size that they can be conveniently handled and raised to the surface. As prepared for shipment the mass copper usually contains from 70 to 80 per cent. of fine metal and sometimes is wholly free from foreign matter, yielding from 90 to 95 per cent. when melted down in the furnace. "Barrel copper" includes the smaller pieces weighing usually a few pounds which are too large to go under the stamps and too small to be shipped loose.

When cleaned the usual yield of "barrel" is from 60 to 70 per cent. of metal. "Stamp copper" forms a large part of all the veins. The ore is prepared to go under the heads by being calcined and broken into small fragments; and when this roasting process is completed, it is ready for shipment. Care has to be taken that the heat is so regulated that no part of the metal is fused.

The Lake Superior mineral region naturally divides itself into four districts, each characterized by its geographical position, and by the mode of the occurrence of its minerals. These are—

1. Keweenaw Point District.
2. Portage Lake District.
3. Ontonagon District, and
4. Isle Royal District.

In this order the several districts will be described in the narrative which follows:

The *Keweenaw Point District* embraces a large number of mines, some extensively worked, and extends over a space of 36 miles in length and from two to three miles in breadth. Its geological features are strongly marked. The metaliferous trap extends through it east and west, and there are through nearly its whole extent two well defined ranges, known as the *Greenstone Range*, and the *Bohemian* or *Southern Range*. The former comprises a line of bluffs rising sharply from the valleys of Eagle and Montreal rivers, which drain the district and flow in opposite directions. The *Greenstone Range* is made up of compact crystalline trappean rocks. Its northern limits are not sharply defined, but southward, between this and the next inferior bed, there is a stratum of conglomerate accompanied by a thin deposit which seems to be a consolidated volcanic ash, and beneath these lies the great southern metaliferous belt. The bed of conglomerate, which, at the eastern end of the Point, is from 30 to 40 feet thick, gradually thins out, and finally disappears, while the crystalline and amygdaloid rocks remain as well defined as before. The bed between the conglomerate and greenstone often contains thin sheets and particles of copper, and the conglomerate itself is not without

frequent indications of the same metal. To the south of this belt of conglomerate, the amygdaloid extends from two to three miles, occupying the low grounds of the Eagle and Montreal valleys. On the north the greenstone occupies a width on the surface of a quarter to half a mile, and gradually becomes less crystalline and compact. At length, by an imperceptible change, the rock is found to have become amygdaloid, resembling that on the other side of the conglomerate. From the point where this change occurs, to the first belt of sandstone, is a space of a mile or more which is occupied by a variety of trappean beds, some of which are more or less metaliferous; but together they constitute the "northern metaliferous amygdaloid belt," in which several important mines are worked. Still further to the north is a series of alternating belts of amygdaloid and sandstone, varying from 50 to 500 feet in thickness, and these are again succeeded by a heavy belt of conglomerate which occupies an extent on the surface of nearly a mile. Beyond is still another bed of amygdaloid rock of about 1,500 feet in thickness, succeeded again by conglomerate, which forms the northern portion of the Point from its extremity to Agate Harbor.

The mines of Keweenaw Point, almost without exception, are worked on metaliferous deposits, which have all the characteristics of true veins. They cross the belts of rock nearly at right angles to the strike of the formation, and have in many instances been bored through both the igneous and aqueous formations from the southern amygdaloid belt across the greenstone, the northern metaliferous beds, and the alternating sandstone and conglomerate, to the lake shore. It has not yet, however, been ascertained that the same veins extend across the southern range, and there bear sulphurets. It seems probable, nevertheless, that such is the fact. In their passage through the different rocks the veins exhibit marked changes. In the conglomerate their *gangues* are mostly calcareous, and the copper usually concentrated into large masses, and in one instance black oxide has been found in this rock. In the true

copper-bearing rock the veins appear with a gangue made up of quartzose matter mixed with calcareous spar and the zeolitic minerals. The width of the productive veins is usually from a foot to three feet, but rarely hold these dimensions for a considerable distance. The wider the vein, however, the richer are its metallic contents. In all the district few faults interrupt the continuity of the series in the older rocks. The general parallelism of the productive bodies indeed is remarkable, and they do not have any tendency to unite with one another to form what the Cornish miners call "champion lodes." The dip of most of the veins is nearly perpendicular, no deviation of more than 8° or 10° occurring anywhere. The selvages are well marked, being separated from the wall-rock by a thin layer of red clay or flucan, and the walls themselves striated and polished.

The principal shipping places of Keweenaw Point District are Copper Harbor, Agate Harbor, Grand Marais Harbor, Eagle Harbor, Cat Harbor, Eagle River, etc., all on the south shore of Lake Superior, and in line from east to west.

The following table exhibits the locations of the principal companies preparing for, and that have been or are engaged in mining on the Point:

Titles of Companies.	Locations.			No. of Shares.	Chief Offices.
	T.	R.	S.		
Central.....	58	31	23	20,000	Pittsburg.
Clark.....	58	28	8	20,000	Montreal.
Connecticut.....	58	30	16	10,000	New Haven.
Copper Falls.....	58	31	14	10,000	Boston.
Eagle River.....	58	31	29	10,000	Pittsburg.
Fulton.....	57	32	33	20,000	New York.
Garden City.....	58	31	28	20,000	Chicago.
Meadow.....	58	31	20	—	—
Montreal.....	58	28	17	20,000	Montreal.
Native Copper.....	58	30	10	10,000	Pittsburg.
New York and Michigan.....	58	28	12	—	—
North American.....	57	32	2	10,000	Pittsburg.
Northwest.....	58	30	15	10,000	Philadelph'a.
Northwestern.....	58	31	24	9,000	Pittsburg.
Pittsburg and Boston.....	58	32	36	6,000	Pittsburg.
Phoenix.....	58	31	19	10,000	Boston.
Star.....	58	28	9	10,000	Cleveland.
Summit.....	58	30	19	15,000	Pittsburg.

—Of these the Copper Falls, North American

Northwest, Northwestern, Pittsburg and Boston, and Phoenix Companies, have either been successful or have fair promises of ultimate success; and in the following table are presented the approximate results of each (in the amount of mass, barrel and stamp rock reduced to fine copper), and given in tons of 2,000 pounds from the commencement of operations to the end of the year 1858:

Year.	Copper Falls.	North American.	North West.	North Western.	Pittsburg & Boston.	Phoenix Mines.	Total of all Workings.
1845.....	..	..	..	..	99	..	113
1846.....	..	..	..	..	189	45	253
1847.....	22.7	..	..	..	263.7	56	267
1848.....	11.3	..	..	..	600.4	..	512.3
1849.....	11.3	26.7	..	..	643.6	..	697.8
1850.....	2.2	58.6	16.2	..	368.8	..	644.4
1851.....	..	57.4	147.2	..	425.1	..	661.9
1852.....	6.3	25.6	136.9	..	416.6	7.9	698.9
1853.....	46.1	126.3	126.1	..	536.8	1.7	963.6
1854.....	..	161.3	112.7	..	667.7	2.0	1027.5
1855.....	69.5	186.7	103.4	61.4	937.1	3.4	1411.2
1856.....	..	..	..	..	1110.8	..	1638.3
1857.....	..	..	109.7	..	1088.9	..	1707.6
1858.....	206.1	25.4	..	..	1256.7	33.8	1802.4
Total.....	..	..	..	..	8167.5	..	11,739.2

From the above table, then it appears that since the commencement of operations the mines of this district have yielded a total of 11,739.2 tons of fine copper. The value of this amount, estimated at the average of \$500 per ton, gives a cash equivalent of \$5,869,600.

Beyond the 32d range, in which are situated the Fulton, North American, and Pittsburg and Boston (or as the latter is commonly termed the "Cliff") mines, the distinction between the crystalline trap or greenstone, and the amygdaloid, which is so conspicuous a feature in Keweenaw Point, can no longer be traced. A marked change indeed takes place in the metaliferous deposits within a few miles,

and the mines of Portage Lake, which are next in geographical order being only about twelve miles distant, are quite different from those which have hitherto been described.

The "Portage Lake District" was mined as early as 1846, but it was not before 1852 that general attention was directed to its resources. The metal is here found not so much in regular veins as in other districts; but is disseminated mostly in small masses through certain metaliferous beds which run with the formation and differ very slightly in composition from the other trappean beds with which they are associated. These beds are neither broken up nor deranged in their course, and their metaliferous contents are more uniformly distributed through them than on the Ontonagon. In some instances the same bed has been distinctly traced for a mile or more by a line of ancient excavations, and wherever opened is found to contain copper disseminated through it. There are now at work in this region the following several companies:

Titles of Companies.	Locations.			No. of Shares.	Chief Offices
	T.	R.	S.		
Albion.....	55	34	36	20,000	New York.
Franklin.....	55	34	34	10,000	Boston.
Huron.....	54	34	2	20,000	Boston.
Isle Royale.....	54	34	1	20,000	Washington
Pewabic.....	55	34	32	20,000	Boston.
Portage.....	54	34	36	10,000	Detroit.
Quincy.....	55	34	26	15,000	Detroit.
Ripley.....	55	33	30	10,000	Boston.
Sheldon.....	55	34	36	10,000	Boston.

The following table gives the results of the operations of these companies, exhibiting, year by year, the yield of the most productive:

Year.	Isle Royale.	Pewabic Mine.	Portage Mine.	Quincy Mine.	Total of all Work'gs.
1853.....	9.4	..	3.3	..	12.7
1854.....	18.8	..	5.6	..	24.4
1855.....	163.4	11.7	28.7	6.8	226.9
1856.....	119.6	71.4	47.3	17.0	308.2
1857.....	162.2	146.8	82.7	75.4	495.6
1858.....	235.4	225.6	1	198.5	754.6
Total.....	708.8	455.5	..	297.7	1,822.4

In 1858 the Franklin yielded 61.3 tons and the Huron 33.8.

Probably 10 per cent. may be added to the aggregate above shown, which would include

the amounts taken from the mines previous to any regular returns being made, (1846-1853), and also the amounts taken from the few mines which have been omitted in the list. This would give a total from the region of 2004.6 tons, which valued at \$500 per ton, would be worth in cash, \$1,002,300.

The "Ontonagon Region" takes its name from the principal river by which it is drained. This stream has three branches flowing respectively from the east, south and west, and uniting nearly at the same point, they cross the trap range at right angles to its course, furnishing a tolerable means of communication between the mines and the lake. The mines are situated on the trap range, and are worked on both sides of the river for a distance of 12 to 15 miles. Between these mines and those of Portage Lake, the interval is about 25 miles, and in all that distance there are few, if any, open workings. The trap range in that part of its course is much broken into small knobs, and is almost entirely concealed by drift. To the west the limits of the really valuable part of the range are not yet defined.

There is considerable difference both in the character of the rocks and the mode of occurrence of the cupriferous deposits when compared with those of Portage Lake and Keweenaw Point. The trappean rock is more developed, and epodite becomes a frequent associate both of the rock and the veins, almost always occurring where copper is found. West of the Ontonagon a large part is made up of a large reddish quartzose porphyry, which is non-metaliferous; and intercalated in the trap are frequent beds of conglomerate which are usually quite thin, and to the north, the trap range is flanked as in Keweenaw Point, by heavy beds of this rock. The copper occurs in four forms of deposit—indiscriminately scattered through beds of trap; in contact deposits, between the trap and sandstone or conglomerate; in seams or courses parallel with the bedding of the rocks, and having the nature of segregated veins; and in true veins coinciding in direction with the beds of rock, but dipping at a

different, and usually a greater angle, in the same direction with the formation.

The principal mines of the Ontonagon Region, with location, etc., are enumerated in the following tabular form:

Companies.	Locations.			No. of Shs.	Offices.
	T.	R.	S.		
Adventure.....	51	38	35	10,000	Pittsburg.
Algoma.....	51	37	30	20,000	Cleveland
Aztec.....	51	37	31	....	Pittsburg.
Bohemian.....	51	38	34	20,000	Philadelp'a.
Clinton.....	49	41	17	20,000	Ontonagon.
Derby.....	49	41	19	20,000	New York.
Douglas Hough-					
ton.....	51	37	15	10,000	Detroit.
Evergreen Bluff.	50	38	6	20,000	Detroit
Fire-Steel River.	51	37	22	10,000	Pittsburg.
Flint-Steel R'r.	50	39	11	20,000	New York.
Forest.....	50	39	30	10,000	Boston.
Glen Falls.....	50	39	31	10,000	Boston.
Gogebio.....	49	42	22	15,000	Detroit.
Hudson.....	49	41	11	20,000	New York.
Indiana.....	51	30	21	20,000	Ontonagon.
Magnetic.....	49	42	25	....	Detroit.
Mass.....	50	38	6	....	Pittsburg.
Merchants'.....	51	38	35	20,000	Pittsburg.
Merryweather.....	48	42	9	20,000	Detroit.
Metropolitan.....	49	42	26	15,000	Detroit.
Minnesota.....	50	39	15	20,000	New York.
National.....	50	39	16	10,000	Pittsburg.
Nebraska.....	50	39	12	20,000	Detroit.
Norwich.....	49	41	11	20,000	New York.
Ohio.....	51	38	36	....	Cleveland.
Olgima.....	..	..	..	....	....
Ohio Trap.....	49	40	5	12,000	Pittsburg.
Peninsula.....	50	39	15	....	....
Ridge.....	51	38	..	3510,000	Pittsburg.
Rockland.....	50	39	..	1120,000	New York.
Sharon.....	49	41	9	20,000	New York.
Shawmut.....	52	36	10	20,000	Boston.
Superior.....	50	39	14	10,000	New York.
Toltec Consoli-					
dated.....	51	30	25	20,000	Boston.
Victoria.....	..	..	..	....	....
West Minnesota.	50	39	17	20,000	New York.
What-Cheer...	51	37	16	20,000	Providence.
Windsor.....	49	41	12	20,000	New York.

The annual yield of the most productive of the above workings is shown in the annexed exhibit:

Year.	Adven- ture.	Minne- sota.	Rock- land.	Total of all Workings.
1848.....	..	4.8	..	4.8
1849.....	..	39.2	..	39.2
1850.....	..	77.3	..	80.7
1851.....	6.2	230.6	..	240.7
1852.....	14.6	390.1	..	416.9
1853.....	6.0	392.3	..	499.7
1854.....	11.6	572.2	16.1	1043.8
1855.....	31.6	1075.5	119.4	1631.9
1856.....	73.2	1392.8	177.5	1879.9
1857.....	123.8	1514.7	284.7	2126.7
1858.....	68.0	1505.7	181.2	2073.7
Total.....	335.0	7195.2	778.9	10,038.0

Valuing the aggregate produce of these mines at \$500 per ton, the total sum amounts to \$5,019,000.

The "Isle Royale Region" comprises the island so called. In many respects it is the counterpart of the South Shore regions. The ridges of trap traverse the island longitudinally, and this rock, with occasional intercalated belts of conglomerate, forms the whole island. The trap all belongs to the bedded class, and contains the same metaliferous products as Keweenaw Point. The strata have, however, a dip which is just the reverse of that of the rocks on the opposite side of the lake, and their mural faces are turned to the north. The most extravagant notions formerly prevailed with regard to the richness of the island in copper, and soon after the opening of the Lake Superior Region nearly the whole surface was taken possession of by different companies, and operations were commenced at numerous points.

The metaliferous deposits, however, were found not to be generally of that persistent character as to be worthy of being worked, and the island was subsequently abandoned. Only two companies have left records of their operations—namely, the Siskawit, (T. 66, R. 34, S. 13), and the Pittsburg and Isle Royale, (T. 65, R. 36, S. 12), companies, which are represented in the following table:

	Siskawit Company.	Pittsburg & I. R. Co.	Total (tons.)
1849.....	15.8	1.7	17.5
1850.....	15.6	4.5	20.1
1851.....	18.7	..	18.7
1852.....	31.2	..	31.2
1853.....	14.4	6.2	20.6
Total.....	95.7	12.4	108.1

—making a total product in the years embraced 108.1 tons, or in money, \$54,050.

Having in the foregoing accounts given a rapid sketch of the several districts of the mining regions of the American shores of Lake Superior, the following statement will show the results of each year for each district, and the total production for the whole region:

Years.	Keweenaw Point.	Portage Lake.	Onton- agon.	Isle Royale.	Total (tons.)
1845....	11.3	..	..	..	11.3
1846....	25.3	..	..	..	25.3
1847....	236.7	..	..	..	236.7
1848....	512.3	..	4.8	..	517.1
1849....	697.8	..	39.2	17.5	754.5
1850....	544.4	..	80.6	20.1	645.2
1851....	661.9	..	240.7	18.7	921.3
1852....	598.9	..	416.9	31.2	1047.0
1853....	863.6	12.7	499.7	20.6	1396.6
1854....	1027.5	24.4	1043.8	..	2095.7
1855....	1411.2	226.9	1631.9	..	3370.0
1856....	1638.3	308.2	1897.9	..	3844.4
1857....	1707.6	495.6	2136.7	..	4399.9
1858....	1802.4	754.6	2073.7	..	4630.7
Total..	11,739.2	1,822.4	10,038.0	108.1	23,617.7
Total value of 23,617.7 tons, at \$500 per ton, \$11,853,850					

No one can say that, on the whole, eminent success has not been attained. In the fourteen years embraced in the tables the annual product has increased from about 10 tons to nearly 5,000.

A survey of the tables will show that success has not been uniform. Few of the many companies that have been organized, and spent vast sums in explorations and works, have had any return for the capital invested, and many never will have. Yet each of these companies commenced operations under equally favorable auspices. The total product of the year 1858 was due in two-thirds of its amount to one or two companies in each of the districts on the southern shore of the lake—namely, the Pittsburg and Boston, (Cliff,) in Keweenaw Point; the Pewabic and Isle Royale, in Portage Lake, and the Minnesota in Ontonagon. To these are due 3223.4 tons out of the total of 4630.7 tons set down as the year's production.

Mr. Whitney, in his "Mineral Wealth of the United States," wrote up the statistics of this region to the end of 1853. From what data he had been able to collect, he estimated, up to that date, the whole amount of money expended in the region at \$4,800,000, and the value of the copper produced at \$2,700,000. The amount of capital since spent, up to the 31st December, 1858, has probably been an equal sum, making a total of \$9,600,000, or in round numbers \$10,000,000. There are no attainable data to verify this estimate, but it is near

fore stated at \$11,853,850. At the date of the publication of Mr. Whitney's work only \$504,000 had been paid in the shape of dividends, and this only by two companies—the Minnesota and the Pittsburg and Boston—the former having divided \$90,000, and the latter \$414,000. Both have since sustained their regular distributions, and still occupy the first place in the market. Up to the end of 1858, the first company had divided \$630,000, being \$31 50 on each share, on which had been paid only \$3 50, and the latter \$900,000, or \$150 on each of the 6,000 shares issued by the company, for which only \$18 50 had been paid. But, on the whole, we may as well adopt the conclusion come to by Mr. Whitney, who, in his work, before referred to, sums up the position and prospects of the mines of the Lake Region with the following remarks:

"Of the capital thus invested in the country a considerable portion has been expended in opening mines, which may reasonably be expected to become profitable to the adventurers. A very considerable amount was, however, irrevocably sunk during the first years of speculation and foolish excitement. But even at the present very moderate prices of Lake Superior copper stock, their actual cash value exceeds the whole amount that has been expended therefor. The mines of this region have a character of permanence, and there can be little doubt that their product will go on regularly increasing, as it has done in the years since mining operations may be said to have fairly commenced."

The trap range extends into Wisconsin, and has at various times been examined by the geologists of the United States Survey of that State, and by other explorers. The results of their examinations have not been favorable, and there are few veins of copper beyond the borders of Michigan which promise to become of value. The only company at present operating in this region is the Fond du Lac (T. 47. R. 13, S. 8), with 10,000 shares, and the office worked, and this company (the "Montreal," with a capital of £300,000 in £5 shares) ap-

worked, and this company (the "Montreal," with a capital of £300,000 in £5 shares) ap- of which is at Superior City. No shipments have as yet been made from the Wisconsin district.

On the north shores of Lake Superior and Lake Huron, within the territorial limits of Canada and the islands adjacent thereto, mining has at various times been carried on with varying success. The trappean rocks of the region lying behind Isle Royale, and which form lofty cliffs in the headlands and numerous islands of that vicinity, are apparently the counterpart of those of the northern range of Keweenaw Point. No workings are at present going on here; but from 1846 to 1849 a rich vein was worked on Spar Island and the mainland opposite at Prince's Bay. The mine, however, proved unremunerative, although it contained large quantities of native silver; and the high expectations of the stockholders were unfortunately destined to be entirely disappointed. A number of localities were also formerly worked on Michipicoten Island and on the northeast side of the lake. The Quebec and Lake Superior Mining Association commenced operations in 1846, at Pointe Aux Mines, Mica Bay, on a vein said to be two feet wide, and rich in grey sulphuret; but, after erecting furnaces and expending £30,000, it appears that there was little ore to smelt, and the works were abandoned. That there are copper deposits in these regions, however, is abundantly attested, and future efforts may be more successful.

The mines on the north shore of Lake Huron are in a formation consisting of white and often vitreous sandstone, or quartz rock, passing into a jasper conglomerate, and interstratified with heavy masses of trap. These are supposed to be of the same age as the copper-bearing rocks of Lake Superior, and the chief difference seems to be in the great amount of amygdaloid trap present in the former. In these mines the ores are entirely sulphurets, and principally copper pyrites associated with a gangue of quartz. The Bruce mine is the only one now actually

pears to have been eminently successful. The mine is situated about 50 miles below Sault Ste. Marie, and due north of the extremity of St. Joseph's Island. The vein was discovered in 1846, and is contained in a dark-colored hornblende trap. There are several other companies located on the north side of the lake (Huron); and it is probable that the success of the Montreal company will lead to a general opening up of the undoubted resources of the mineral lands of this portion of the American continent.

The ores produced in the Canada mines are all, or mostly all, sent to Swansea for reduction. The total exports of ores and copper from Canada (probably all from the Bruce mine) since 1850 have been as follows:

	Ores. Tons.	Copper. Tons.	Official Value.
1850.....	272.16	62.44	\$36,583
1851.....	1349.82	122.80	86,756
1852.....	598.08	24.92	32,420
1853.....	1639.68	61.60	94,325
1854.....	1731.52	..	103,328
1855.....	1708.00	1.96	91,627
1856.....	1106.51	..	82,834
1857.....	2869.54	3.36	240,942
1858.....	2158.24	2.24	191,949
Total (9 years)	13,433.45	279.32	\$960,764

The American ores are shipped from the various parts of the southern shore of Lake Superior, and find their way, via the Canal of Sault Ste. Marie, to the smelting establishments at Detroit, Cleveland and Pittsburg, and in a less amount to those at Bergen Point in the Lower Bay of New York, at New Haven, and at Boston, and also to those at Baltimore. The four latter, however, are chiefly supplied with ores from the Appalachian mines of Tennessee, Virginia, etc., and from foreign countries.

On a future occasion the statistics of the copper production of other parts of the Union, and also of the amounts of copper imported into the United States for smelting purposes, may form an interesting article for the columns of the "JOURNAL." On the first point, however, our information is fragmentary, and the dissemination and distance of the producing regions so wide, that it will be difficult to bring toge-

ther the material necessary to its elucidation. With regard to the importation of copper ores the returns are made annually by the Registrar of the Treasury in the tables of "Commerce and Navigation," and require only the labor of compilation to make them available.

PRODUCTION OF COPPER IN THE UNITED KINGDOM.

1. MINES, ORES RAISED AND FINE COPPER PRODUCED, 1856.

Localities.	Number of mines worked.	Tons* of ores raised.	Tons fine cop'r produced.
Cornwall.....	135	183,851	12,019
Devon.....	23	47,067	3,138
Cumberland.....	5	4,388	293
Anglesea.....	2	2,668	178
Caernarvon.....	2	1,752	117
Cardigan.....	6	182	12
Radnor.....	2	116	8
Total, England and Wales	175	240,044	15,765
Cork and Tipperary.....	4	7,382	775
Waterford, Wicklow, &c..	7	5,599	517
Total, Ireland	11	12,961	1,292
Sundry Districts not included in the above..	..	151,654	10,110
Total, United Kingdom	187	404,592	27,167
Value in £ stg.		1,741,516	2,993,611
Value in dollars		8,722,580	14,918,035

2. RESULTS OF 1854, 1855 AND 1856 COMPARED.

	1854.	1855.	1856.
Mines worked, No.	151	165	187
Ores raised, tons.	333,734	359,470	404,592
Metal produced, "	22,286	23,849	27,167
Value of ores....	\$7,419,030	8,201,945	8,722,580
Value of metal....	\$12,436,875	15,214,385	14,918,035

3. FINE COPPER PRODUCED, 1821-1856.

	Tons.		Tons.
1821.....	11,492	1839.....	16,425
1822.....	12,340	1840.....	14,582
1823.....	10,840	1841.....	14,092
1824.....	10,869	1842.....	15,213
1825.....	11,601	1843.....	14,927
1826.....	12,424	1844.....	16,620
1827.....	13,805	1845.....	16,668
1828.....	13,650	1846.....	16,732
1829.....	13,503	1847.....	15,433
1830.....	14,819	1848.....	16,486
1831.....	16,472	1849.....	15,232
1832.....	16,184	1850.....	16,464
1833.....	14,801	1851.....	16,016
1834.....	15,732	1852.....	13,629
1835.....	16,206	1853.....	19,429
1836.....	16,542	1854.....	22,286
1837.....	11,368	1855.....	23,849
1838.....	14,078	1856.....	27,167

* Tons of 2,000 lbs.

CENSUS OF ASSINIBOIA.

[Taken by William R. Smith, Esq., 20th May, 1856, under the authority of the Governor and Council of Assinibioia, or Red River Settlement, Hudson's Bay Company's Territories.]

1. FAMILIES, DWELLINGS AND INHABITANTS.

Parishes.	Houses.	Families.	Persons.
St. James'	70	68	414
St. John's	93	81	567
St. Paul's	93	91	585
St. Andrew's, Upper	102	93	554
St. Andrew's, Lower	104	121	653
St. Peter's	117	118	596
St. Francois Xavier	97	178	1,101
St. Charles	40	62	348
St. Norbert de la R. Salle	83	101	625
St. Boniface	134	183	1,248
Total, 1856	933	1,096	6,691
" 1849	745	1,052	5,391
" 1843 .....	..	..	5,143

2. CIVIL CONDITION OF INHABITANTS.

	1856.	1849.
Men—Married	999	873
" —Unmarried	230	145
Women—Married	1,010	877
" —Unmarried	285	135
Sons—Above 16 years	536	382
" —Under 16 years	1,486	1,314
Daughters—Above 15 years	562	373
" —Under 15 years	1,583	1,292
Total	6,691	5,391
Males	3,251	2,714
Females	3,440	2,677

3. ORIGIN BY FAMILIES.

Country.	1856.	1849.	1843.
England and Wales	40	46	22
Scotland	119	129	110
Ireland	13	27	5
Norway	1	3	0
Switzerland	2	2	2
Total European Families	175	207	139
Canada	92	162	152
Rupert's Land (native half-breeds)	828	684	571
Total families	1,095	1,052	862

4. RELIGION BY FAMILIES.

Census.	Catholic.	Protestant.
1856	534	548
1849	513	539

5. LIVE STOCK.

	1856.	1849.	1843.
Horses	1,503	1,095	821
Mares	1,296	990	749
Oxen	2,726	2,097	..
Bulls	290	155	107
Cows	3,593	2,147	2,207
Calves	2,644	1,615	1,508
Pigs	4,674	1,565	1,976
Sheep	2,429	3,096	3,569

6. LAND, BUILDINGS, IMPLEMENTS, MACHINERY.

	1856.	1849.
Land cultivated (acres)	8,371	3,392½
Houses inhabited	933	745
Stables	1,232	1,066
Barns	399	335
Ploughs	585	492
Harrows	730	596
Carts	2,045	1,918
Canoes	522	528
Boats	55	40
Wind Mills	16	18
Water Mills	9	1
Thrashing Mills	8	..
Reaping Machines	2	..
Winnowing Machines	6	..
Carding Mills	1	..

7. CRIMINAL STATISTICS.

(Cases tried in the Petty Local Courts, 1855-6.)

Trespass	1	Assault and Battery	1
Damage or misdemean'r	6	Defamation	1
Against privileges	1		

Total

—and in the Quarterly General Courts, one other case.
The number of suits for the collection of debts was 27, involving a sum amounting to £46 13s. 6d.

8. AVERAGE VALUE OF PROPERTY, (1856.)

Houses—25 at £300	£7,500
" —100 at 100	10,000
" —200 at 50	10,000
" —200 at 25	5,000
" —397 at 12	6,764

922	Total	£39,264
Stables—616 at £8		£4,928
" —616 at 5		3,080

1,232	Total	£8,008
Barns—199 at £12		£2,388
" —200 at 8		1,600

399	Total	£3,988
Live Stock—Horses. 2,799 at £8 10s		£23,791
" —Oxen .. 3,016 at 4 10		13,072
" —Cows .. 3,593 at 2 10		8,983
" —Calves. 2,644 at 1 00		2,644
" —Pigs .. 4,674 at - 10½		2,454
" —Sheep. 2,429 at - 12		1,457

19,155	Total	£52,401
Implements—Ploughs. 585 at £4 10s		£2,632
" —Harrows. 730 at - 5s		183
" —Carts .. 2,045 at 1 0s		2,045
" —Canoes .. 522 at - 12s		313
" —Boats .. 55 at 15 0s		825

3,937	Total	£5,998
Machinery—Wind Mills	16 at £100.	£1,600
" —Water Mills	9 at 150.	1,350
" —Thrashing Machines	8 at 40.	420
" —Reaping Machines	2 at 30.	60
" —Winnowing Machines	6 at 2.	12
" —Carding Mills	1 at 24.	35

42	Total	£3,377
Aggregate Value		£111,036

8. PUBLIC BUILDINGS, ETC.

Crime.... 1 Gaol or Jail.
 Education. 17 Schools, including a College at St. John's.
 Religion.. 9 Churches, viz.: 3 Roman Catholic, 4 Ch.
 of England, and 2 Presbyterian.

		Congre- gations.	In- come.
Missions—Church of England ..	8	3,050	£2,050
" —Presbyterians	1	400	150
" —Roman Catholic.....	4	2,500	100

CENSUS OF IONIAN ISLANDS, 1858.

1. EXTENT AND POPULATION.

Islands.	Area. sq. m.	Population—			Of which foreign's
		Males.	Females.	Total.	
Corfu	227	37,796	37,736	75,532	9,700
Cephalonia	311	38,524	37,957	76,481	1,993
Zante	161	20,757	17,870	38,627	436
Santa Maura.....	156	10,678	9,365	20,043	102
Ithaca	44	5,936	5,412	11,348	..
Cerigo	186	7,016	5,991	13,007	52
Paxo	26	2,729	2,296	5,025	45
Total.....	1,111	123,436	116,627	240,063	12,328

2. POPULATION OF CITIES, ETC.

CORFU (Capital of Republic)	15,921
Argostoli	9,271
Zante	14,026
Santa Maura.....	4,579
Ithaca	5,412
Cerigo	5,991
Paxo	404

3. OCCUPATION.

Agriculture	49,563
Commerce	6,323
General industry	7,989

4. MOVEMENT OF POPULATION.

Births.....	5,843
Marriages..	5,363
Deaths.....	1,301

5. LAND APPROPRIATION.

Acres.		Acres.	
In corn.....	19,906	In flax	1,849
In maize	52,275	In gardens.....	302
In barley.....	4,845		
In grapes.....	8,031	Total in cultivation	465,927
In olives	265,179	Pasture lands	97,536
In currants	112,918		
In cotton	622	Total.....	563,463
—leaving 146,577 for uncultivated lands, town plots, &c.			

CENSUS OF TEXAS.

The population of Texas, according to the returns of the Census of 1858, amounts to 457,620. Of this number 138,265 are slaves and 250 free persons of color. Of the whites 67,350 are voters. It is estimated that at least 40,000 immigrants have since the closing of the rolls settled in the State. In 1850 the population was only 212,492, and hence for the eight years the increase is shown at 245,128 or 115.3 per centum.

POPULATION OF BOLIVIA, 1858.

(According to Col. Juan Oндarza's New Map.)

Districts.	Population.
CHUQUISACA—	
Chuquisaca	23,971
Yamparaez	60,836
Tominay Azero	84,174
Cinti.....	54,687
LA PAZ DE AYACUCHO—	
La Paz	99,059
Omasuyos	103,976
Yngavi	83,699
Sicasica	57,666
Muncas	40,872
Yungas	36,823
Larecña	31,647
Inquisibi	19,930
Misiones	1,650
POTOSI—	
Potosi	34,989
Porco	99,873
Chayanta	76,684
Chichas	60,183
Lipez	9,500
ORURO—	
Oruro	28,340
Paria	52,618
Charangas	29,973
COCHABAMBA—	
Cochabamba	89,918
Cliza	90,560
Tapacari	56,989
Mizque	48,656
Arque	37,590
Ayopaya	26,179
SANTA CRUZ DE LA SIERRA—	
Santa Cruz	50,636
Vallegrande	48,148
Chiquitos	27,500
Cordillera	26,880
VENI OR BENI—	
Veni	4,170
Mojos	24,503
Caupolicán	21,100
Yuracares y Guarayos	4,200
TARIJA—	
Tarija	23,693
Salinas	43,890
Concepcion	21,317
ATACAMA—Atacama or Cobiya	5,273
	1,712,352
Add for uncivilized Indians in the forests -	
—Of Veni	100,000
—Of Santa Cruz	40,000
—Of Chuquisaca and Tarija	100,000
—Of La Paz and Cochabamba	5,000
*Grand total.....	1,957,352

Population of Cities—Sucre, 23,979; La Paz, 76,372; Potosi, 22,856; Oruro, 7,980; Cochabamba (or Oropesa), 40,678, and Mizque, 3,786; Santa Cruz, 9,780; Vallegrande, 3,608; Trinidad, 4,170; Tarija, 5,680; Cobiya, 2,680.

* On p. 155, and in accordance with the "Alm. de Gotha" for 1859, the population of Bolivia is stated at 2,326,126.

CENSUS OF ST. LOUIS.

A census of this city, taken in 1858, returned the population at 135,330 souls. Of this number 59,657 were American, 43,874 German, 22,014 Irish, 3,451 English, 1,337 French, and 1,951 foreigners of other origin; and of the total 132,174 were whites, and 3,156 colored, viz.: 1,672 free and 1,484 slave. The increase of the population from 1850 has been as follows:

	White.	Free Col.	Slaves.	Total.
1850	73,842	1,362	2,656	77,860
1852	84,340	1,455	1,859	87,654
1854 .....	..	..	..	122,134
1856 .....	..	..	..	125,201
1858	132,174	1,672	1,484	135,330

—the increase in the eight years being 57,470 or 73.8 per cent.

CENSUS OF NASHVILLE.

The population of this city, as ascertained by a census taken a few months ago, is 25,115. Of this number 19,728 are white (10,757 males and 8,971 females), and 5,385 colored, viz.: 1,758 free and 3,627 slave. The population of the suburbs is estimated at 6,700, making a total of 31,815. The annual value of manufactures is stated at \$2,374,700, and the total of commerce at \$22,476,812. About a hundred steamers visit the wharves annually, with an aggregate of 108,000 tons.

MINERALS EXPORTED FROM CHILE, 1857.

The total value of the exports of Chile in 1857 amounted to \$20,126,461, of which sum \$15,981,008 represented the value of mineral exported. The separate values due to the several descriptions of mineral were as follows:

Copper Ores	\$2,292,171	
Copper Regulus	5,027,040	
Bar Copper	2,908,376	\$10,227,587
Silver Ores	\$1,670,743	
Bar Silver	1,947,303	
Silver Coin	1,107,509	4,725,555
Copper and Silver Regulus		530,130
Gold Coin		497,736

Total value

Thus of the total exports more than one-half is found to be copper, and more than one-fourth silver; and that over three quarters of the entire exports consist of copper and silver

CITIES OF WISCONSIN.

Basing its calculations on the aggregate vote cast at the late election, and estimating it at one-sixth of the total population, the *Racine Advocate* deduces the following as the number of inhabitants in each of the principal cities and towns of this State:

Cities and Towns.	Vote Cast.	Popul. 1859.
Milwaukee	7,790	46,740
Racine	1,607	9,642
Janesville	1,341	8,046
Oshkosh	1,165	6,990
Madison	1,116	6,696
Watertown	1,027	6,162
Beloit	875	5,250
Kenosha	794	4,764
Fond du Lac	773	4,638
Portage City	661	3,966
Berlin	511	3,066

The population of Milwaukee in 1850 was only 20,061, and in 1855 only 30,447; that of Racine in the same years was 5,107 and 8,044; that of Janesville, 3,451 and 7,018; and for the other cities the increase is equally remarkable.

COAL TRADE OF PITTSBURG.

The coal trade of Pittsburg, including the coal from the Monongahela bituminous region, has increased year by year, as shown in the following table:

Year.	Exported. Bushels.	Consumed. Bushels.	Total. Bushels.
1845	2,660,340	2,189,660	4,850,600
1846	5,236,500	2,739,280	7,975,780
1847	7,200,450	2,535,330	9,555,780
1848	7,150,355	2,670,205	9,820,560
1849	7,145,150	2,604,850	9,950,000
1850	8,560,180	3,940,020	12,500,200
1851	8,250,120	4,499,880	12,750,000
1852	9,960,950	4,699,150	14,560,000
1853	11,590,730	4,359,270	15,950,000
1854	14,632,580	3,322,380	17,955,960
1855	18,560,158	4,315,292	22,875,450
1856	8,165,196	1,834,804	10,000,000
1857	25,684,550	3,289,046	28,973,596
1858	24,696,669	4,803,331	29,500,000

These figures show how steady and wonderful has been the increase in this great and important branch of business. Exception the year 1856, in which the Ohio was unnavigable for coal boats for more than 200 days, its progress has been steadily onward. Within the 14 years included in the above exhibit it has increased six-fold. The value of the coal shipped in 1858 amounted to \$3 169 894.

FRENCH EMIGRATION.

The French Minister of the Interior has published a report on the emigration movement in 1858, showing the following results:

The number of French who emigrated to foreign countries, in that year, was 9,004, and to Algeria, 4,809—making a total of 13,813, being a decrease of 4,926 as compared with the next preceding year. In the number of emigrants to foreign countries the proportion of males was 69 per cent., and that of females 31 per cent., and to Algeria 58 and 42 per cent. respectively.

Of the emigrants to foreign countries, 2,156 went to the United States, 2,510 to South America, 1,558 to Spain, 720 to Switzerland, and 2,060 to other countries.

The emigrants for Algeria embarked at Marseilles, most of them as free passengers. Those for the United States embarked for the most at Havre, and a few for New Orleans at Bordeaux. Those that went from the South of France to the La Plata took shipping at Bordeaux and Bayonne.

The diminution in the number of emigrants in 1858, as compared with the preceding year, was caused, first, by the harvest of last year being more favorable, and next by the commercial and financial revulsion in the United States and the unsettled state of affairs in South America.

The transit of foreign emigrants through France, which in 1857, amounted in number to 26,000, was reduced in 1858 to 11,119.

PRESBYTERIAN STATISTICS.

For the ecclesiastical year 1858 the returns of the American Presbyterian Church were as follows:

	Old School.	New School.	Total.
Synods	33	23	56
Presbyteries	168	108	276
Ministers	2,577	1,545	4,122
Churches	3,487	1,542	5,029
Licentiatees	297	134	431
Candidates	493	370	863
Members added on } examination	23,945	10,705	34,650
Total communicants ..	279,530	137,990	417,520

BAPTIST STATISTICS.

The *New York Examiner* states that there are the United States—Associations, 590; churches, 12,163; ordained ministers, 7,590; licentiatees, 1,035; communicants, 992,851, and the number baptized in 1858 was 98,508. Among the States, Virginia numbers of this

denomination, 115,146. Connected with the denomination are enumerated 33 colleges; 14 theological seminaries; 29 weekly newspapers, and 16 monthly and 2 quarterly periodicals. New churches erected in 1858, 64; new societies constituted, 238; ministers ordained, 304.

MASONRY IN THE UNITED STATES.

The following statistics are derived from the latest information contained in the proceedings of the various Masonic Grand Lodges of the United States:

	Lodges.	Members.
Alabama	217	7,223
Arkansas	103	1,929
California	118	4,474
North Carolina	107	5,010
South Carolina, estimated	66	3,100
District of Columbia	11	639
Connecticut	55	4,784
Delaware	10	452
Florida	38	1,234
Georgia	221	12,027
Illinois	243	8,526
Indiana	240	8,594
Iowa	108	3,178
Kansas	6	170
Kentucky	290	9,979
Louisiana	103	3,979
Maine	83	2,391
Massachusetts, estimated	96	3,800
Maryland	33	1,626
Michigan, estimated	105	5,000
Minnesota	24	805
Mississippi	205	7,310
Missouri	126	4,903
Nebraska, estimated	3	100
New Hampshire	37	1,731
New Jersey	49	2,204
New York	409	30,000
Ohio	253	10,913
Oregon	15	490
Pennsylvania	156	11,428
Rhode Island	16	1,048
Tennessee	174	7,750
Texas	212	2,451
Vermont	44	2,064
Virginia	126	4,614
Wisconsin	100	2,907
Total	4,202	183,883

The number of Free Masons in the United States is probably much greater than this table shows, as there are many to be found everywhere who are not affiliated with any lodge. The law of fraternity is said to be "once a Mason always a Mason."

FRENCH RAILROADS.

The following gives the length of the railroads of France on the 31st December:

	1857.	1858.
Northern	536.9 miles.	577.5 miles.
Eastern	873.1 "	1010.6 "
Ardennes	32.5 "	95.0 "
Western	600.0 "	715.0 "
Orleans	924.6 "	1089.6 "
Mediterranean	1042.5 "	1133.2 "
Lyon-Geneva	109.4 "	142.5 "
Southern	455.6 "	496.2 "
Dauphin	55.0 "	80.6 "
Ceinture (round Paris) ..	10.6 "	10.6 "
Bessegès-Alais	18.7 "	20.0 "
Anzin-Somain	11.9 "	11.9 "
Carmaut-Albi .....	..	9.4 "
Grasse-Sasac-Reziers ..	..	32.5 "
Total	4670.8 "	5424.6 "
Aver's length operated ..	4296.2 "	5061.2 "
Earnings	\$62,221,602	\$67,047,803
Average earnings } per mile	\$14,489	\$13,248

The average cost of French railroads has been about \$128,340 per mile.

RAILROADS IN EGYPT.

The railroad from Cairo to Suez being now completed, Egypt possesses the following lines:

From Alexandria to Cairo	131 miles.
" " to Mariouth	17 "
" " to Meks	6 "
" " to Rassateen	3 "
" Tanta to Samanud	21 "
" Cairo to Suez	91 "
" " to Barragod	15 "
" " to Beni Suef	76 "

Total.....360 miles.

—Besides which there are smaller branches from Cairo to the Citadel and Kasr Nin; from Samanud to Mansoura and Damietta, and from Damanhour to Afte and Rosetta. The exact mileage of these minor, but still important lines, is not yet accurately known.

INDIAN RAILROADS.

The length of railroads sanctioned for British India up to the end of 1858 is 4,847 miles. Of this, the length of 559 miles is opened for traffic, and 3,038 miles is in course of construction—leaving 1,250 miles on which work has not been commenced. In the course of the present year there will be completed 747 miles additional to that already in operation; in 1860,

270 miles more, and in 1861, 296 miles more. Thus at the end of 1861, there will be in India a total length of finished railroad amounting to 1,872 miles. The total capital guaranteed for these railroads is about \$200,000,000, one-half of which has been already paid up. The cost of construction is about \$56,000 per mile, or less than one-third that of English railroads. When the lines are completed there will be four great arterial railroads, opening up the whole of India to the seaboard at Calcutta, Madras and Bombay, and giving to the country commercial facilities which centuries of native rule would not afford to it.

STATISTICS OF THE STATE OF IOWA, 1859.

No. of Dwelling Houses	103,785
Total amount of Population	633,449
No. of Males	332,806
No. of Females	300,743
No. entitled to vote	136,457
No. of Militia	116,034
No. of acres of Improved Lands	3,109,436½
No. of acres of Unimproved Lands	7,335,657
No. of miles of Railroad finished	390½
No. of miles of Railroad unfinished	310½
Acres of Meadow	172,362½
Tons of Hay	433,603½
Bushels of Grass Seed	48,363½
Acres of Spring Wheat	750,719
Bushels harvested	3,090,049½
Acres of Winter Wheat	29,190
Bushels harvested	203,204
Acres of Oats	315,572½
Bushels harvested	1,703,760
Acres of Corn	986,096
Bushels harvested	23,366,684
Acres of Potatoes	24,031½
Bushels harvested	1,497,204½
No. of Hogs sold	337,261
Value of Hogs sold	\$2,111,425
No. of Cattle sold	141,146
Value of Cattle sold	\$2,950,187

SOUTH CAROLINA.

Subscription of the State to internal improvements:

Shares in the South Carolina R. R. Co	\$30,000
" " North Eastern R. R. Co	220,000
" " Spartanburg and Union R. R. Co ..	250,000
" " Charlotte and So. Ca. R. R. Co ..	31,710
" " Greenville and Columbia R. R. Co ..	348,000
" " Blue Ridge Railroad Company	200,000
" " Cheraw and Darlington R.R.	100,000
" " Pendleton Railroad Company	35,000
" " Laurens Railroad Company	50,000
" " Charleston and Savannah R.R.	270,000

\$2,134,700

LIBRARY DEPARTMENT.

BOOKS, MAPS AND CHARTS, ETC.,

Purchased and donated since last Report.

BOOKS, ETC., ADDED BY DONATION.

WISCONSIN—(*Presented by Henry V. Poor, Esq.*)

—Wisconsin: its geography and topography. By I. A. Lapham. 2d Edition. 1 vol., 12mo. pp. 208.

GEOGRAPHY AND STATISTICS—(*Presented by the Author.*)

—Progress of the United States of America from the Earliest Periods—geographical, statistical, and historical. By Richard Swainson Fisher, M.D., etc. New York, 1854. 1 vol., roy. 8vo., pp. 432.

—A new and complete Statistical Gazetteer of the United States of America, etc. By Richard Swainson Fisher, M.D., etc. New York, 1853. 1 vol., roy. 8vo., pp. 960.

—The Book of the World—being an account of all republics, empires, kingdoms and nations, in reference to their geography, statistics, commerce, etc., together with a brief outline of their rise, progress and present condition, etc. By Richard S. Fisher, M.D., etc. New York, 1852. (2d Edition.) 2 vols., 8vo., pp. 624-721. With maps and charts.

—Gazetteer of the State of Maryland, compiled from the returns of the 7th census of the United States, and other official documents: to which is added a general account of the District of Columbia. By R. S. Fisher, M.D., etc. New York: 1852. Roy. 8vo., pp. 122.

—Indiana: in relation to its geography, statistics, institutions, county topography, etc. By R. S. Fisher, M.D. New York: 1852. 1 vol., 12mo., pp. 126.

—Colton's Traveler and Tourist's Guide through the Western States and Territories, etc. By Richard S. Fisher, M.D. New York: 1857. 1 vol., 12mo., pp. 150.

—The Spanish West Indies—Cuba and Porto Rico: geographical, political and industrial. Cuba from the Spanish of Don J. M. de la Torre, and Porto Rico by J. T. O'Neil, Esq. Edited by Richard S. Fisher, M.D. New York: 1855. 1 vol., 12mo., pp. 190. With a map.

HISTORICAL MAGAZINE—(*Presented by the Publisher.*)—Historical Magazine (*monthly*), 1859. New York: C. B. Richardson, 348 Broadway. In pamph., 8vo.MAP OF THE NORTH AMERICA, 1755.—(*Presented by R. S. Fisher, M.D.*)

—A pocket Mirror for North America, which exhibits at one view the European Settlements, with the claims of the English, and the French encroachments. Published by Thos. Jefferys, Geographer to His Royal Highness the Prince of Wales. [Dated May, 1755.] This map shows the "French encroachments and extensive claims, as set forth in the late French maps of Messrs. D'Anville, Robert, Bellin, and in particular the map inserted in the Memoires concernant Les Limites de l'Acadie;" and is very valuable as an exposition of the territorial condition of the United States and Canada at the period immediately preceding the war, which ultimately in the overthrow of the French power in North America.

SWEDEN AND NORWAY (*Presented by the Academy of Sciences, Stockholm, Sweden.*)

—Kongl. Svenska Vetenskaps—Akademiens Handlingar Ny Följd. I. 2. Stockholm, 1856. 1 vol., 4to., pp. 305 to 493.

—Öfersigt of Kongl. Vetenskaps—Akademiens Handlingar XIV. Stockholm, 1857. 1 vol., 8vo., pp. 431.

—Fregatten Eugenies Resa omkring Jorden, 1851-53. Fysik I. Stockholm, 1858. 1 pamph., 4to., pp. 80.

—Voyage autour du Monde sur la Fregate Suedoise l'Eugene, 1851-53. Physique I. Stockholm, 1858. 1 pamph., 4to., pp. 80. (Translation from the Swedish.)

NAUTICAL GEOGRAPHY—(*From the Natural History Society of Emden.*)

—Nautische Geographie von Dr. Heinrich Metger, Subrector am Gymnasium und lehrer an der Navigationschule zu Emden. Zweiter theil—Physikalische Geographie—mit figuren. Hanover, 1859. 1 pamph., 8vo., pp. 55 to 272.

GEOGRAPHY AND STATISTICS—(*From the several societies.*)

—Mittheilungen der K. K. Geographischen Gesellschaft, or Journal of the Geographical Society, Vienna, 1858. 1 pamph., 8vo., pp. 130.

—Proceedings of the Royal Geographical Society of London. Vol. 2, No. 6, for October, 1858. 1 pamph., 8vo.

—Journal of the Statistical Society of London for December, 1858. 1 vol., 8vo.

SCIENCE AND ART—(*Presented by Prof. Silliman.*)—The American Journal of Science and Arts (*monthly*), 1859. New Haven. 1 pamph., 8vo.

PACIFIC RAILROAD—(*Presented by J. H. Schultz & Co., Publishers of the American Railroad Journal, No. 9 Spruce street, New York.*)

—Railroad to the Pacific—Northern Route: its general character, relative merits, etc. By Edwin F. Johnson, C.E. New York, 1854. 1 vol., (pamph.) 8vo., pp. 174. With maps and plans.

BOOKS, ETC., ADDED BY PURCHASE.

Missionary Voyages. 1 vol., 4to.
 Dixon's Voyage. 1 vol., 4to.
 Mackenzie's Voyage. 1 vol., 4to.
 Mortimer's Northwest America. 1 vol., 4to.
 Weld's Travels. 1 vol., 4to.
 Pauper Reports. 1 vol., 8vo.
 Sanitary Report (New York). 1 vol., 8vo.
 Bowditch's Ashantee. 1 vol., 4to.
 Wilson's Journal. 1 vol., 4to.
 Collin's South Wales. 1 vol., 4to.
 Franklin's Journey. 2 vols., 4to.
 Brook's Travels. 1 vol., 4to.
 Hunter's Voyage. 1 vol., 4to.
 Symes' Ava. 1 vol., 4to.
 Colinett's Voyage. 1 vol., 4to.
 Hearne's Journey. 1 vol., 4to.
 Forster's Journey. 1 vol., 4to.
 Klaproth's Travels. 1 vol., 4to.
 Ellis' Polynesian Researches. 2 vols., 8vo.
 Voyage of the Alceste. 1 vol., 8vo.
 Marsden's Sumatra. 1 vol., 8vo.
 Stewart's South Seas. 2 vols., 8vo.
 Bryant's Wanderings. 2 vols., 8vo.
 Coxe's Columbia. 1 vol., 8vo.
 Franchere's Narrative. 1 vol., 8vo.
 Mountains and Molehills. 1 vol., 8vo.
 Voyage of the Resolute. 1 vol., 8vo.
 Smithsonian Report for 1852. 1 vol., 8vo.
 Kohl's England, etc. 1 vol., 8vo.
 Macfarlane's Japan. 1 vol., 8vo.
 Egypt and Nubia. 1 vol., 8vo.
 Annual Register (Doddsley's). 36 vols., 8vo.
 Huc's Tartary, etc. 1 vol., 8vo.
 Algeria. 1 vol., 8vo.
 St. Hilaire's Travels. 1 vol., 8vo.
 Shepperd's Travels. 1 vol., 8vo.
 Pillars of Hercules. 2 vols., 8vo.
 Barth's Africa. Vol. 3d. 8vo.
 Latrobe's Rambler. 2 vols., 12mo.
 Cooke, etc., on New Mexico and California. (4 vols. in 1.) 8vo.
 Riley's Narrative. 1 vol., 8vo.
 Practical Tourist. 2 vols., 12mo.
 Kœppen's Atlas. 1 vol., 4to.

Carey's Atlas. 1 vol., folio.
 Lyell's United States. (2 vols. in 1.) 12mo.
 Appleton's Hand Book of American Travel. 1 vol., 12mo.
 Historical, Geographical and Statistical View of New York.
 Dearborn's Guide through Boston.
 Stranger's Guide to Montreal.
 Mitchell's Guide through the United States.
 North American Tourist, 1841.
 The Northern Traveler, 1828.
 Travelers' Guide through the Middle and Northern States, 1834.
 Travelers' Own Book to Saratoga Springs, etc., 1844.
 The Tourist for 1835.
 Picture of New York, 1807.
 Tanner's New York Hand-Book, 1844.
 Leigh's Road Book of England and Wales, 1831. (2 copies.)
 Britton's Picture of London. 26th Edition.
 Cambrian Tourist, 1830.
 Leigh's New Picture of London, 1830.
 Stranger in Liverpool, 1832.
 Pleasure Tours in Scotland, 1832.
 Hardy's Picture of Dublin, 1831.
 Stark's Picture of Edinburgh, 1831.
 McPhun's Guide through Glasgow.
 Murray's Hand Book for France, 1843.
 Galignani's Guide through France, 1831.
 Galignani's Guide of Paris.
 Downes' Guide through Switzerland and Savoy, 1830.
 Surenne's French Manual and Traveler's Companion, 1830.
 Dictionnaire de la Langue Françoise abrege.
 Mitchell's Map of Europe (in case).
 Plan of the City of Quebec (in case), 1842.
 Mitchell's Map of Pennsylvania (in case), 1833.
 Burr's Map of the State of New York, 1834.
 La Tourrette's Map of the Creek Territory in Alabama (in case), 1853.
 Tanner's Map of Georgia and Alabama, 1840 (in case).
 New York Almanac, 1857 (Mason's).
 Continental Traveler (Leigh's) 1833.
 Cruchley's Plan of London (in case).
 Reynold's New Map of London.
 Leigh's Road Map of England, Wales and Scotland (in case).
 Nouveau Plan Routier du Paris (in case), 1833.
 Conducteur aux Cimetieres du Pere la Chaise, Montmartre, etc., with maps, etc.

JOURNAL

OF THE

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No. 10.

PROCEEDINGS.

NOVEMBER 3d, 1859.—In the absence of the President, Archibald Russell, Esq., 2d Vice-President took the chair.

The following gentlemen were elected resident-members of the Society: William Henry Arnoux, Rev. William Alvin Bartlett, Henry Beekman Graham, Robert M. C. Graham, George W. Hodges, John B. Ireland, James O. Noyes, M. D., and Frederick S. Stalknecht.

William B. Ogden, of Chicago, was elected a non-resident member.

The Foreign Corresponding Secretary reported the receipt of a large number of letters from foreign societies, relating to exchanges of publications and documents, and read a communication, (dated "The Hague, June 16th, 1859") from the Central Commission of Statistics of Holland, enclosing their act of organization, and soliciting the co-operation of the Society. The Foreign Corresponding Secretary was directed to prepare and forward a suitable reply.

The Librarian reported the accessions to the library, since the last meeting, to be as follows: By donation, 290 volumes, 1,050 pamphlets, and 34 maps and prints; and by purchase, 201 volumes and one globe. Among the more important works added to the library were Ritter's *Asien* in 22 volumes, Drake's *Voyages*, Dampier's *Voyages*, a set of the *Annual of the Imperial Geological Institute of Vienna*, the *Annals of Congress* in 42 volumes,

and a complete collection of the public documents of Minnesota since the formation of the territorial government.

The Rev. Dr. Thompson informed the Society that a letter had been received from Carl Ritter asking the aid of the Society in the foundation of a Humboldt-Stiftung at Berlin. Dr. Thompson remarked that scarcely had the communication been received, when the mails announced the death of the venerable author. He moved that the Committee on Topics and Proceedings be instructed to take measures to enable the Society to testify its appreciation of the immense services rendered through a long life time to geographical science by Carl Ritter.

The motion was unanimously adopted.

Mr. Disturnell presented to the Society two maps, one of the Government Map of the first United States Arctic Expedition, upon which he had traced the route pursued by Captain M'Clintock in the *Fox*; the other an official map of Arizona, showing the extent of the Mesilla Valley, lately purchased from Mexico.

The Secretary of the Council then read a paper upon "*The Present Condition of Iceland*," translated from the Icelandic, and giving a succinct account of the population, government, commercial resources and natural production of the island.

The reading of the paper was followed by a conversation upon the subject, in which the Chair, Dr. Thompson, Mr. Prime, and others took part. After which the thanks of the Society were voted to the author and translator of the paper. *Adjourned.*

DEPARTMENT OF GEOGRAPHY.

NORTH AMERICAN FISHERIES.*

The great fisheries of Newfoundland, Canso and parts of the Gulf of St. Lawrence were discovered by Sebastian Cabot, the earliest voyageur to the northern coasts of America, in the reign of Henry VII., 1497. The reports of Cabot were soon spread throughout Europe, and fishing vessels from different nations began to resort to the Banks of Newfoundland for annual supplies of fish. In the reign of Queen Elizabeth of England, Sir Humphry Gilbert took position of and claimed sovereignty over Newfoundland, whose few and scattered immigrants acknowledged his right.

The French had long disputed the British claim to the fishery of Canso, a narrow strait between Nova Scotia and the Island of Cape Breton, until 1749, when the English conquered the island, and captured Louisburg, the stronghold of France in America.

From this period British subjects occupied the banks and shoals skirting the coasts of Nova Scotia; but the Banks of Newfoundland were common to all nations. The territory of Labrador was also claimed by France; but after the conquest of Canada, the whole country was ceded to England, excepting two small islands, St. Pierre's and Miquelon on the south side of Newfoundland. Subsequently England ceded to France the exclusive right to fish from Cape Ray to Cape St. John.

After the United States had gained their independence, and the peace of 1783 was concluded, the treaty between the two countries stipulated the right of the Americans "to take fish on the Grand Bank and all other banks of Newfoundland, in the Gulf of St. Lawrence and all other places in the sea, where the inhabitants of both countries had been used before, and the liberty to fish on such parts of the coast of Newfoundland as British fishermen used, (but not to dry, or cure fish thereon),

and on the coasts, bays and creeks of all other British dominions in America."

The war of 1812 abrogated all former treaties. The Convention of 1818 secured to the United States the right to fish all along the coasts and harbors of British North America; but not within three marine miles of the shore, and to cure fish in such bays and harbors as were not inhabited, and also to enter any bay or harbor for shelter, to repair damages, or to obtain provisions, or water.

The treaties between Great Britain and the United States were as difficult to defend as they were to observe. The framers of those treaties were unacquainted with the practical working of their schemes; hence frequent misunderstandings arose between the two countries, even threatening war. The American fisherman was not conversant with nice logical distinctions. He knew of no game laws regarding the fishes of the sea. Indeed, the ocean was considered to be the high way of all nations, and that nature offered her bounties freely to all and recognized no national boundaries.

Notwithstanding the decrees of the Convention of 1818, vessels from the eastern States would visit the remote harbors of the colonies and barter for codfish, and an illicit trade was carried on which called forth the interference of the local authorities of the British provinces, and an armed force for the protection of the fisheries. Sometimes American vessels were seized within the limits of three miles from the shore, and condemned, and their owners ruined. National ships of war were also sent to cruise along the coasts—to defend the fisheries on one side, and to protect the fishermen on the other.

This state of things continued until the years 1850 and 1851, when the principal northern coasts and islands were visited by Admiral, the Earl of Dundonald, late Commander-in-Chief on the British North American and West Indian Stations. I had the honor to accompany his lordship during the examinations of the fisheries; and also in extensive geological explorations of the shores; and I believe that it

* A paper read before the American Geographical and Statistical Society, by Abraham Gesner, M. D., F.G.S., etc., January 6, 1859.

has been through his influence and comprehensive views that a treaty of reciprocity has recently been sanctioned, whereby the American fisherman has been relieved from his former embarrassments. He is now permitted to fish where he pleases, except in the rivers, and a free trade is open between the United States and the colonies.

In my history of the Province of New Brunswick I advocated a close adherence to the then existing treaties, but a laborious inspection of the fisheries, and a better acquaintance with the persons engaged in them, have led me to abandon my former views and advocate a more practical and generous policy.

There are obstacles to the study of the natural history of fishes that cannot be overcome. The haunts and habits of those that inhabit the deep sea cannot be seen; and it is only by examining the contents of their stomachs that we can learn any thing regarding the nature of their food. Many kinds cannot be taken either by hook, or net; others are rarely seen, and doubtless some inhabit depths almost unfathomable.

It has long been believed, and the error still continues, that deep sea fisheries, like those of bays and rivers whose shores are inhabited, are constantly on the decline, from the myriads of fish annually captured. This error has been the foundation of national disputes, and especially as regards the Grand Bank of Newfoundland.

It is certain that the shore fisheries of inhabited districts decline; and some have so far fallen off that they are not worth pursuing. But this fact has arisen as one of the effects of civilization. Damming the streams for the erection of saw mills, which prevent the fish from ascendancy in the spawning season—the saw dust of the mills; the passage of steamboats and other vessels; the poisonous matter poured into the water from cities, towns and villages, and other causes destroy the fisheries of estuaries and rivers far more rapidly than the hook, net, or seine of the fisherman. Now

none of these causes act upon the living mantle of the ocean's bed. The cod, halibut, hake, cusk and other fishes that live at fifty and a hundred fathoms beneath the surface of the sea, and many miles from the dry land, are beyond the reach of such influences, and the vast numbers captured are annually restored by their miraculous powers of reproduction. I have estimated the numbers of *ova* found in each of the following fishes as follows: Codfish, 62,000; herring, 52,000; mackerel, 72,000. So far as history and statistics inform us the fisheries of the Banks of Newfoundland, and other shoals along the northern arm of this continent, have not fallen off during the last 200 years. It is a wise provision of the Creator that the great victualling office of the world shall be well supplied. Even the playful mackerel and herring, which pay yearly visits to the shores, maintain their numbers against fleets of fishermen; the latter in his season covering thousands of miles of coast with *ova*.

The food upon which fishes subsist forms an interesting inquiry. I cannot stop here to discuss this part of my subject, further than to remark that multitudes of fishes die every year. Yet in sailing over the surface of the ocean a dead fish is seldom seen, except in the vicinity of some submarine volcano, or sulphurous, or hot spring. The weak and dead are devoured by flesh-eating fishes, who, in their turn, become the prey of their successors. Portions of the bottom of the shallowest parts of the ocean, if not the deepest abysses, are covered with vast tracts of sea weeds of great growth. These plateaus and submarine pastures afford food for some kinds of the finny tribes. Other parts abound in shell fish, crustacea, &c. These sustain other broods. Great numbers of fishes are fed by the waters of the sea, and the sediment poured into it by every shower that washes the dry land. Each of this class is a living chemical laboratory, assimilating the oxygen and hydrogen of the water, and the carbon and nitrogen of its impurities, to the formation of bone, blood, flesh, and scales. Floating fields of sea weeds abound in small

fishes, and the dolphin glides from wave to wave in quest of the floating nautilus or sun-fish. The entire surface of the ocean teems with life—and, like the stormy petrel, some kinds of fishes are provided with strainers in their mouths by which they separate the animalcula from the watery element. The gay butterfly, moth, and many land insects supply food for salmon, trout, and other inhabitants of lakes and rivers. A closer examination, than the one I have thus hinted at, will convince any student in Natural History that nature has provided abundantly for all the inhabitants of the mighty deep.

DIFFERENCE BETWEEN NORTH AND SOUTH AMERICAN CONTINENTS.

It might appear at first sight that the physical features of Northern and Southern America do not materially differ. But without reference to the great difference of their climates, they have dissimilarities which affect animal life whether it be on the land or in the water. The southern continent abounds in lofty mountains and rivers of the greatest magnitude. Its terrestrial formations are eminently volcanic, and in certain parallels of latitude, the ocean is studded with coral islands. The mountains of the north are not remarkable for their elevation, and volcanic rocks are less frequent. Its rivers are chiefly of the third and fifth classes, while its bays and lakes are the largest in the world. The positions of the land and water influence climates far more than is generally understood; and the geological formations of every country, not only effect its mining and agricultural industry, but also the vegetable and animal creations both of the sea and of the land, and even the physiology of man himself.

The Gulf Stream, passing along our coast, greatly ameliorates the climates from Cape Hatteras to Greenland. The temperature of this mighty oceanic current, as it passes through the Bahama Strait, is 68° Fah. When it reaches the Grand Bank of Newfoundland its temperature is 46° on an average, and 6° higher than the surrounding ocean. I found its temperature to shade off as the shores of Newfound-

land were approached. The condensation of the warm and humid atmosphere that is spread over that Atlantic current is the cause of those dense and dreary fogs which in the early part of summer hover over all the shores from the State of Maine to the remotest parts of Labrador and southern parts of Greenland.

I have no doubt whatever that George's Bank, Isle of Sable, the Bank of Newfoundland, and other shoals of less magnitude, are all the gifts of the Mexican current. I have taken broken shells from the deep sea lead, such as the *cyprea*, and others, whose genera cannot be found upon the shores of Northern America; and floating fields of sea weed and drift equally attest the transporting power of that mighty stream.

DESCRIPTION OF NORTH AMERICAN FISHERIES.

The North American fisheries commence at about 40° North latitude, or in the latitude of New York, and extend thence in a northerly direction to the Polar Sea. It is probable that the extreme north is open water, whose frigid-ity is modified by the positions of the adjacent continents. The appearance of droves of whales coming down from the polar regions at certain periods favors this opinion. Some fishes may be said to be common to the north and south, or inhabitants of the temperate regions. The shad, tautog, or black fish, and many others, will fall under this class.

It will be recollected that the interior lands of the northern continent, during the winter, are covered with snow, and the rivers are coated with crystal mantels of ice. The melting of this snow and ice produces great changes in the heat of the atmosphere, and also lowers the temperature of that part of the ocean that washes the coasts. The spring season sends down vast quantities of fresh water, and carries forward a great amount of partially decomposed vegetable and animal matter which supplies food for fishes. This I believe to be one cause by which the inhabitants of the sea are led instinctively into the shallow bays and rivers at the close of spring and the beginning of summer.

From George's Bank to Newfoundland, fish are most abundant in the spring, when they always approach the shores and run into shallow water. This fact, however, may arise in part from the necessity which is supposed to exist in reference to depositing their *ova*. As soon as summer appears, codfish, halibut and the early immigrant herring withdraw from the vicinity of the land to deep water, and dogfish, haddock, pollock and others supply their places. I found this exchange in the Bay of Fundy and some of the estuaries of New Brunswick took place in the course of a single week, and it is gradually extended from latitude 40° to Newfoundland. Farther north, and in districts of almost perpetual ice, it was not observed.

Great numbers of shad are secured yearly in some of the rivers of the American coasts. This is one of the fishes that occupies a medium position between the North and the South. He appears in Charleston, and still farther South, in January, at Norfolk in February, in the Hudson at New York in March, in Massachusetts in April and May, at the entrance of the Bay of Fundy in June, and at the extremity of that Bay in July. He always frequents muddy rivers, where the temperature of the water is from 50° to 60°. He feeds upon schrimp and worms, and sometimes upon a soft mossy sea weed. The shad of the Hudson are superior to those of more Southern rivers. The finest I have ever seen were those of St. Mary's Bay in Nova Scotia. New York receives its full share of this delicious fish, and, like the strawberries and other fruits in whatever State they are gathered, they come to our markets. I do not undertake to say that northern fishes may not be found beyond the limits I have stated. Their kinds shade off both North and South; but wherever they are caught out of their true latitudes, they are generally more or less lean.

In my descriptions, I will call the several kinds of fish, to be noticed, by their common and not by their scientific names. For commercial purposes the latter are more convenient.

Starting then from New York, in a northerly direction, we pass the Mediterranean or Sound and the outer shore of Long Island, and farther on, the entire seaboard of New England. Great quantities of fish are annually taken on these shores and in the adjacent waters—Cod, halibut, pollock, haddock, shad, mackerel, etc. These afford a vast amount of food to the inhabitants and luxuries for the table of the citizen. Great numbers of menhaden are caught by the people of Long Island. Thousands of cart-loads are used for manure. Again, the fish are boiled by steam—the oil extracted, and the residuum converted into what is called artificial guano.

The numbers and value of the fish taken on the shores, and in the bays and rivers, can never be accurately ascertained—as they are taken by thousands of individuals, and devoted to home consumption.

The fisheries of the New England States have ever been considered of great value. The war of the Revolution checked their progress; but from 1786 to 1790 Massachusetts alone sent annually to the deep sea fisheries no less than 500 vessels and 3,000 seamen. These numbers continued to increase until the embargo of 1808 and the war of 1812. The latter almost destroyed the offshore fishing, and the bays and rivers were resorted to. The bounties paid by the United States on fish and fishing vessels have proved to be a wholesome stimulus to this branch of industry.

The State of Maine has some excellent in-shore fisheries. Passamaquoddy, the eastern boundary of the State, exports cod, pollock, haddock and herrings, and mackerel are taken in their season. Between Campo Bello and Eastport, where the bay does not exceed three miles in breadth, at certain times of tide, the boats of the Americans and provincials mingle together in one common fleet. So plentiful are the cod and pollock that before the bait reaches the bottom it is seized, and every boatman draws away with all his might until his boat is loaded, or the fish on the turn of the tide depart. An excellent herring is caught in

Passamaquoddy Bay. They are generally taken in weirs, and smoked for New York and other markets. Maine also sends a number of vessels to George's Bank, Newfoundland and coast of Labrador.

GRAND MANAN.

The Island of Grand Manan is about 20 miles long and 8 miles wide. It is situated about 25 miles from Eastport. Its northern side is an elevated and almost perpendicular mass of trap rock, containing zeolites. Southward, the land slopes down to the sea. At its southwestern extremity the trap rocks extend out beneath the water, and a lighthouse and fog-bell give warning to approaching vessels. Over the submarine ledges, the tide runs rapidly and breaks into wreaths of foam. This is a favorite spot for pollock, of which great numbers are taken with the hook and line. There are several large fishing establishments on the island, and the harbors at its eastern extremity afford shelter for boats and small craft.

On the western extremity of Grand Manan, sea-gulls congregate in vast numbers. The trees of a large tract of forest are occupied by their nests. Clouds of those birds hover over the wood, and the cries of their young in the month of July, and other peculiarities, drew forth an admirable description from the pen of the celebrated Audubon, during one of his northern tours. Grand Manan, as well as the Island of Campo Bello, has been the resort of money diggers. Deep pits have been dug at many places to find the buried treasures of the notorious Captain Kid.

GEORGE'S SHOAL OR GEORGE'S BANK.

The most valuable deep sea fishery on this part of the American coast is the shoal called George's Bank. Its length may be estimated at 100 miles, and its breadth 40 miles, with a depth of water varying from 10 to 60 fathoms. Its summit is dry at high spring tides. The entire bank abounds in fine cod, haddock, halibut, pollock, and their attendants. At certain seasons shoals of mackerel and herring appear at the surface of the water. The deep sea fish may be taken at all times of the year.

The fishes I have named are taken in great numbers to supply the fish markets of New York and Boston. Numbers of small shallops and schooners frequent the Banks, and are seen tossing about in very tempestuous weather. The holds of these vessels are divided into compartments, and into them the sea is allowed to flow freely. Into these watery cells the fish are thrown the instant they are disengaged from the hooks. As soon as a cargo is obtained the vessel runs for New York, or some other port, where the fish are disposed of, and may be often seen alive in our markets. Such as are intended for more southern ports are packed in ice.

FISHERIES OF THE BAY OF FUNDY.

Of the fisheries of the Bay of Fundy my limits compel me to speak generally. There are but few miles of its shores that I have not visited, and therefore I will only notice some of their peculiarities. The elevation and the rapidity of the tides in this bay are well known. In a calm day a vessel will here drift 60 miles in one direction on the ebb tide, and be carried back the same 60 miles on the flood tide. In every part of this capacious bay the fishes, I have already noticed, are abundant in their seasons, and salmon frequent nearly all the rivers. St. John, the principal seaport of New Brunswick, exported, in 1850, 40,000 salmon, 14,000 barrels of alewives, and 1,000 barrels of shad. The total exports of fish for that year, the produce of the Bay of Fundy fisheries, is stated to have been to the value of \$250,000. This sum is less than the value of the fish consumed by the inhabitants.

At the eastern extremity of Minas Basin, and the mouth of the Shubenacadie river, the tide rises no less than 75 feet. At low water the sea is withdrawn more than 20 miles from the point of its highest elevation, and by its rapid rise on the flood tide it forms a mighty tidal wave from 4 to 6 feet high. This wave, or *bore*, as it is called, makes forward over the mud flats with the noise of distant thunder, tearing up the sand banks formed by the previous ebb, and overwhelming every boat or ves-

sel that may lie exposed to its fury. The very front of this wave is occupied by the shad which are rapidly carried onwards to the rivers. In the Peticodiac River boats sometimes fish within 10 feet of the margin of the watery precipice, which at the top seems to have a backward current that prevents the boats from plunging headlong over its border. I have traveled 25 miles an hour in Indian canoes, on the top of the bore in the Shubenacadie River, and within 200 yards of its rolling front which instantly covers the mud flats and shingle beaches, with a smooth but rapid current of water.

On the north side of Minas Basin, and at a place called Five Islands, in the county of Colchester, there is a natural fish pond. A basin of more than 100 square yards has been formed in the hard rock. At high spring tides the borders of this basin are left dry, while its centre has 4 or 5 feet of salt water. In the month of June the codfish pursue the herring close in shore, and drop into this saucer-shaped cavity. The tide withdraws and the fish are imprisoned. On one occasion I accompanied some farmers to the place. They drove down their ox carts, and, with pitchforks, transferred upwards of 400 fine codfish from the sea to the land, where they were divided by casting lots.

Small whale, known as *grampus*, are quite numerous in the Bay of Fundy. Of these none are captured, as they are said to be too shy to be approached by a whale boat; but I have seen them floating and basking in the sun, apparently asleep, and during periods of several hours.

Porpoises are also plenty. A few of these are shot by the native Micmac Indians, who value them for their oil. Whaling might, perhaps, be successfully pursued in these waters by fitting out vessels for the double purpose of whaling and codfishing.

The principal fisheries of the western part of Nova Scotia are at Digby and Yarmouth. At the former place not less than 50,000 boxes of herrings are taken in weirs annually. The fish are small in size, and when smoked and

packed afford an article of export much sought for every where.

The fisheries of Yarmouth and adjacent bays are also valuable. A few years ago a vast shoal of mackerel appeared in these waters; but they were considered too small in size to be cured and shipped. The next year the fish appeared again with increased dimensions. The fishermen concluded that they would wait and make preparations for the third year. The third season brought back to them immense numbers of the fish; but, to their astonishment, they were of a smaller size than ever. This is evidence that the mackerel does not visit the same shore every year.

Following along the shores and bays of the southern side of Nova Scotia, great numbers of the finny tribes are captured; and a number of small vessels resort to the banks and to Labrador from that quarter. In general, the in-shore fisheries are much neglected. The rivers abound in alewives in the month of June, and there is fine salmon fishing in Gold River and a few other rapid streams.

Halifax, the principal capital of the province of Nova Scotia, exports to Europe and the United States great quantities of dry and pickled fish, and also salmon laid down in ice. That city is said to have the finest fish market in the world. I have seen fine codfish and halibut sold at the wharves for two pence per pound. During the autumnal months fine fat mackerel in great numbers appear in the harbor and its spacious basin. At Herring Cove the fishery is pursued with profit, and vessels make regular trips to the Gulf of St. Lawrence and coast of Labrador.

The coast from Halifax to the Gut of Canseau is but thinly populated, and the industry of the inhabitants is divided between agricultural and maritime pursuits. The Strait of Canseau is about eighteen miles in length, and at its narrowest part only three quarters of a mile in breadth. This opening from the Gulf into the Atlantic has long been celebrated for its fisheries, and still continues to yield a rich harvest to the industrious fisherman. A few

years ago a shoal of mackerel threw themselves into a small cove upon the shore, near Guysborough, at the head of Chedabucto Bay. The inhabitants turned out and made an attack upon them, and in the space of twenty hours secured four thousand barrels.

The entire shores of the Gulf of St. Lawrence, Prince Edward's Island, and the Island of Cape Breton abound in the kinds of fish I have already noticed. At Arichat, Inganish, Choticamp and other places there are extensive fishing establishments, where it is not uncommon to see ten acres of ground occupied with fish flakes covered with cod during the period of drying. Cape Breton is nearly divided by a little Mediterranean called Bras d'Or. Both cod and herring are taken here in the winter by cutting holes through the ice and lowering down the hook or the net.

The shores of Prince Edward's Island are scarcely less productive than those just mentioned. The island is very fertile, and therefore its inhabitants are chiefly devoted to agriculture. Fine salmon are caught in some of the inlets, and in the summer season trout are plenty several miles from the land and in the open sea.

The coasts of Bay St. Lawrence and Gaspé are perhaps still more valuable for their fishing resources, and they have a number of mercantile houses devoted altogether to the capture, curing and transportation of fish to the Old Country. Salmon still continues to be numerous in many of the rivers, as well as in those of Lower Canada. The streams that fall into the sea on the coast of Labrador abound in this delicious fish. In July and August they take a gaudy fly with great avidity, and angling for them becomes a laborious pleasure. Strong tackle is always necessary. Still farther north salmon are more plenty, and form no inconsiderable part of diet of the Esquimaux Indian.

The Isle of Sable is a well known, and very dangerous shoal about one hundred and sixty miles south of Cape Breton, and in the track of vessels bound from this county to Europe. Its summit on an average is not more than ten

feet above the level of the ocean. It bears a few low bushes, among which wild horses, known as Isle of Sable ponies, roam at large. These horses were originally carried to the island to supply food for shipwrecked seamen and the lighthouse keepers, who sometimes, for long periods, are cut off from the rest of the world. From the conflicting currents of the Gulf of St. Lawrence and the Gulf Stream the shoals about the island are constantly shifting. Fish are abundant on these banks. Still they are not much frequented by fishermen from the danger apprehended of running their vessels aground.

The Island of Newfoundland is nearly four hundred miles in length, and from fifty to two hundred miles in breadth. The Grand Banks of Newfoundland may be estimated to be 700 miles long, and 200 miles broad. The soundings vary from ten to one hundred fathoms. The bottom is not rock as some have supposed; but chiefly sand, sand and shells, and mud. The sailor knows at once when he is over them from the altered appearance of the water. These vast shoals afford the greatest fisheries in the world, and they are frequented three quarters of the year by ships from every part of Europe, and the northern ports of America. Not less than 2,000 ships anchor and fish upon these banks every season, exclusive of smaller vessels from the British provinces and the United States.

St. Pierre's and Miquelon afford the French great facilities for pursuing their ancient occupation at Newfoundland. Those two little islands supply bait and surface for drying cod. From May to November, in crossing the Banks, numbers of foreign vessels may be seen at anchor out in the open sea. They usually send down their upper masts and yards, and haul every rope tight. Here they roll from side to side from month to month, ever baiting and hauling in cod and other deep sea fishes. Few merchant vessels pass the Banks without "*heaving-to* for fish."

Within a few past years, the French, and subsequently others, have introduced a new

mode of fishing. From the stern of the ship they carry out a long line called a bullow. Upon this line, or lawser, a great number of short snoods or cords are fastened, each carrying a baited hook. The bullow having been duly baited, is lowered away and stretched along the bottom of the sea. Several of these destructive lines are sent out from one ship, and hauled in every twenty-four hours, sometimes by hand, and occasionally by a capstan. Frequently a thousand fish are taken at a single haul. It is surprising to see the numbers of uncaptured fish that will rise to the surface of the water at the hauling in of the bullows. Similar fisheries to those I have described extend from Newfoundland along the coast of Labrador to Hudson's Bay, Davis's Strait and Greenland. At those places the fishing season is comparatively short from the early and intense cold. They are now a kind of storehouse for future generations. Vessels laden with frozen herrings arrive at Halifax from Labrador during the winter, and codfish perfectly brittle from the frost supply the market at St. John, New Brunswick, in the months of January and February.

There are no less than three varieties of whales in the the Gulf of St. Lawrence. The first is the large Greenland whale of a color almost black, and sometimes eighty feet in length. The second is smaller in size, and generally known as the "hump-back." Lastly, the narwhal is from eighteen to thirty feet in length, and so black that it is commonly called the black fish. It is armed with a long ivory tusk on the left side of the mouth; but appears quite harmless. I found a narwhal stranded in a remote creek on the Island of Cape Breton. It was eighteen and a half feet in length, and would probably weigh six tons.

The whale fishery of the Gulf and the coast of Labrador was first undertaken by the people of Nantucket. At present it is pursued to a small extent by vessels from Newfoundland and Gaspe; but might, under proper management, be made very profitable to vessels from the United States.

Next in importance to the cod and herring fisheries of these northern latitudes are the seal fisheries. In the latter part of March and about the first of April vessels are fitted out at Newfoundland, and on some of the shores of Nova Scotia and New Brunswick, and are "off for the ice." They are from 40 to 80 tons burthen, with crews of 15 or 20 men each. They seek some opening in the ice floes, running into them until they are completely ice bound. With saws and other appliances the crews cut away the ice, and penetrate as far as possible into its solid masses. Here for a short time they remain at rest, waiting the opening of a "seal meadow." Often, after a long and dreary night, the morning discovers to them thousands of young seals, not larger than kittens, scattered over the ice in all directions. The sealing crew will wait sometimes a fortnight, or three weeks, for the young seals to grow, or until they are as large as ordinary sized dogs. They then embark upon the ice with small boats, or punts, and with clubs and muskets commence the work of death, and stripping the pelts with the fat from the young seals, they transport them to their vessel to be afterwards drained for the oil. An old sealer does not believe that these young seals are ever visited by their dams; but says, uniformly, that they feed upon ice alone. Indeed, it is remarkable how few old seals are seen among the ice where the young ones are so numerous. Among the few and scattered seniors of the oily race I have seen the hooded seal, which has a kind of moveable cap on his head, capable of being drawn down over the eye. The countenances of this variety of the *phoca* tribe are most singularly grave and amusing. Nothing can exceed the forlorn and dreary condition of a sealer in the ice during a storm, and in the night, when ever and anon his vessel is in danger of being crushed between the ice floes, from which there is no escape. Still thousands of fishermen venture on these perilous voyages. Seals are also taken in strong nets in some of the small inlets of Labrador.

While speaking of seals, I may mention the

walrus, an animal of great dimensions. They are usually shy. Nevertheless, I have known an instance of a boy approaching one very closely almost every day. At a place called Cascumpee, near the northern extremity of Prince Edward's Island, a few years ago, a drove of walrus were driven ashore by the pressure of the ice. They attempted to cross a narrow neck of land, when, being discovered, they were attacked by the few inhabitants in that quarter, and a number of them were killed. I was at the place since, and the number of walrus bones on the ground attest the truth of the story.

A single sealing vessel will frequently capture 5,000 seals in a month, which is considered and called a good fare. The numbers taken by vessels fitted out at Newfoundland amount to 500,000 annually.

The value of the fisheries, to which I have adverted, to this country can scarcely be overestimated. France has long viewed the fisheries of Newfoundland as the nursery of her navy, and she has 16,000 men engaged in this employment. Newfoundland sends 10,000 men annually to the seal fishery, and Great Britain has not less than 50,000 sailors upon the shores I have described, engaged in the fisheries. It is to this employment also that the United States would look in the painful event of war, for seamen to man her fleets. At the present time the fishermen of the United States maintain a decided advantage over the fisherman of the provinces in the bounties he receives upon the produce of his industry. The American is, I believe, the best fisherman in the world. The occupation is natural to him, and affords scope for his industry and ingenuity.

In conclusion, there is evidently much to be done in aid of this class of people. The fisherman should be provided with the best charts, and all those philosophical instruments that give indications of the winds and weather. He might also receive much advantage from a better knowledge of the Natural History of fishes. Added to these lighthouses and fog-bells upon dangerous shoals, and upon remote capes and headlands, would guide him in the perils of the storm.

JOURNEY FROM NAGASAKI TO JEDDO.

The following which appeared in the *Java Courant*, of the 5th December, 1858, describes the official journey of the Dutch Commissioner in Japan, from Nagasaki to the capital, and presents so terse and clever a portraiture of social life in this little-known nation that we have considered it worthy of preservation in the JOURNAL. Our readers will find in it much that is valuable in geography, natural history, industrial economy, and ethics; and, moreover, it is a pleasantly written and interesting article, which will attract more than usual attention:

From Nagasaki the route lay across Kiu-Siu to Kokura, from thence across the Strait Van de Capallen to Semenoseki, afterwards in a Japanese junk through the inland sea to Hiogo, and from thence again by land to Osaka, and by Kiota (Miaca) to Jeddo.

The whole journey was a state procession. In each town or village the Commissioner on his arrival was met by the local authorities, who saluted him by bowing to the ground. Persons belonging to the cortege of the Commissioners—which was joined by each landholder on entering his ground—preceded the train and ordered the people to kneel, which was generally done, even by persons at a considerable distance from the road employed in the fields. These marks of honor were repeated along the whole route.

In most places the roads were cleared and swept. Two persons with brooms went before the train. In the villages every one had a broom placed before the door of his house; before some houses also lay two small heaps of sand or earth and a bucket of water, with which the road was sanded, graveled and sprinkled in honor of the Commissioner. In the evening each house was lighted up by a paper lantern. Similar marks of honor, but on a larger scale, were shown to the Commissioner whenever he passed public buildings; in front of these stood ten buckets of water in a pyramidal heap. In a number of places the fire engines were rigged out and decorated in the Japanese fashion. In front of the castles of the noblemen, Japanese officers were drawn up at the grand entrance, some with their state banners and some on horses.

In all the villages and towns, the middle of the streets through which the commander passed was kept clear, and the principal inhabitants were drawn up in rows in front of the houses; the greatest silence was observed.

The Commissioner regularly occupied the houses of the landed proprietors, which were very well furnished and comfortable; but being built in the Japanese style there was no view from them.

The population appeared prosperous, healthy and able-bodied, and even the lowest class was well dressed. When the Commissioner left Nagasaki the smallpox was very prevalent there, but at a distance of four or five miles from that town it ceased. In proportion to the population the numbers marked by smallpox were not great. Vaccination is generally known; but being too much left to the population themselves, children are not vaccinated till their seventh or eighth year. Ophthalmia appears very prevalent, and many persons blind of one eye, or totally so, were noticed. Leprosy and elephantiasis were occasionally met with, but they did not appear to be generally prevalent. The style of building and arrangement of the houses is very plain, and a great uniformity everywhere prevails. They are all of wood and clay; but in the country the houses were found more generally covered with tiles.

The whole country is a succession of hills and valleys, which present very picturesque scenes. The public roads, which near Nagasaki are but indifferent, were everywhere excellent, as much as possible running through the low ground, and, where the nature of the country permitted, unusually broad and overhung by large pine trees. In some places avenues were found some hours' journey in length. The bridges in general are very excellent, and frequently built of hewn stone.

Agriculture appears to occupy an important position in Japan, and, according to the Commissioner, has attained great perfection. On the outward journey the fields were sown with wheat, rye, rape seed, and different kinds of peas and beans. On the return journey, three months later, the Commissioner noticed that the same fields were planted with rice, cotton, gum, oil seed, maize, millet, and different leguminous plants. Tobacco is only found in small patches, and the leaves are dried in the houses in very small quantities. Gardens of tea are not met with, but the tea plant is found on the borders of the fields. The product of this culture does not seem to be considered as worth manufacture. The Commissioner only noticed silk growing on a very small scale. The wax tree was abundant, and many new plantations of it were seen. Gardens or vegetable cultivation were only found in the vicinity of the larger towns. The country produces very few good fruits.

The cherry tree is very abundant in Japan, and is unusually conspicuous from its beautiful blossom. Many orchards of peach trees were observed. There are also in Japan abundance of pears, apricots, plums and several kinds of apples, as well as the vine. But most of these fruits are uncatable by Europeans when uncooked, as the Japanese use all fruits in a half ripe state. The grafting of fruit trees is well known, but little practised.

The ox is plentiful and well attended to, but is only used in cultivation and for transport. Stall feeding is only followed; grazing is not to be met with. The horses are handsome, numerous and valuable. Rather more swine are reared than formerly. Fowls and ducks of different kinds are unusually fine. The wild animals consist of pigs, deer, hares, pheasants, ducks, thrushes, doves, plovers, snipes, &c.

The forests, which only exist on the higher part of the hills, consist principally of handsome pine and cedar trees. Stone quarries are worked in almost every hill. At Nippon the hills are mostly composed of sand, and the water running down from them forms peculiar sand rivers, which have already nearly filled up a number of bays. Coal mines are being more and more worked, especially in the district of Tsikusen, at Kiusiu. The Commissioner did not take notice any other mines; but on one occasion he remarked a finger post, on which was written "Road to the Silver Mine."

Sea fishing is practised on a large scale, and the coast is covered with fishing villages.

Sakki distilleries were seen in many places. Water mills are abundant, from the facilities afforded by the numerous mountain streams. From the same cause irrigation is much used in the rice cultivation.

With the exception of the residences of the higherfunctionaries and the military, each house on the side of the high road is literally either a store or workshop, wherein an almost exclusive retail native trade is carried on, which presents very few objects suitable for export. In every house one is certain to find either a spinning wheel or loom. The population is without doubt great, but it has accumulated in an unusual manner on the borders of the high roads. Scarcely is one village left before another is entered, many of which might be called towns. The number of large towns through which the Commissioner passed was very considerable. Several of these are united to each other by streets some hours journey in length.

The means of overland transport are susceptible of great improvement. Transport by

means of wheel carriage there is almost none. On the other hand, some rivers are navigated by means of small craft, and the coasting trade is uncommonly brisk, especially in the inland sea, between Kiu-Siu, Nippon and Sikokf. When the Commissioner crossed this beautiful sea it was covered with sails. Kokura, lying on Van der Capellen Strait, although a large town, has a very indifferent harbor, in consequence of which very few junks anchor there. Semeno Seki, on the other hand, is resorted to by junks from all parts of Japan—in some months by upwards of a thousand daily.

On the 23d of April the Commissioner arrived at Jeddo, where he found a large house ready for him, on the south side of the castle, prepared at the expense of the government. A number of Japanese officers were ready to receive him, who informed him that, in consequence of indisposition, the Governor of Nagasaki could not then visit him, but would do so in a few days. The American plenipotentiary was lodged on the north side of the castle in a similar manner, and immediately exchanged courtesies with the Dutch Commissioner.

All due preparations having been made, the Commissioner was, on the 13th of May, admitted to an audience with the Emperor, who was found seated on his throne, surrounded by his councillors. The Commissioner advanced, making three bows, and a conversation, which had been arranged beforehand, ensued, the Emperor speaking in the Japanese language and the Commissioner in Dutch, without the intervention of interpreters. The Commissioner then withdrew.

The Commissioner returned to Nagasaki by the same route he had formerly taken, and arrived there the 17th of August.

DEPARTMENT OF STATISTICS.

BENEVOLENT SOCIETIES.*

By the inevitable decree of a Divine Power, man is made to earn his daily bread by the sweat of his brow; and, for the few who are placed above the necessity of unceasing toil, vast numbers are compelled to labor for a bare subsistence. A manufacturer of cotton goods in Rhode Island, recently deceased, who had accumulated a fortune of nearly two millions of dollars, once informed me that for every \$150

of this large capital he had had the services of a laborer for an entire year, at a rate of wages barely necessary for his daily support.

Nor does there appear to exist any reason to complain at this arrangement of human society so far as the happiness of the mass of mankind is concerned, for that same power which has doomed the human race to toil has, likewise, infused a mixture of sorrow and joy into the lot of each individual, and it not unfrequently happens that the possessor of wealth or power, with its vast accumulated responsibilities, has more real suffering than he who carelessly wends his way to his daily recurring toil.

While in health, labor is the most potent assuager of the ills of humanity; and he is as great a benefactor who provides the honest poor with the means of labor at remunerative wages, as he who erects hospitals for their sustenance when deprived of the means of taking care of themselves.

But experience teaches that disease is constantly alternating with health, and, while it deprives the individual of the physical power to earn his own livelihood, places him under the necessity of supplying new and imperious wants. The more provident of those whose daily labor yields a bare maintenance usually make provision for this condition in advance, and, by appropriating a part of their weekly earnings to this purpose, render unnecessary the patronage of those benevolent societies which are scattered broadcast over the land. I propose to invite your attention to such facts connected with these relief societies as benevolent individuals, or societies constituted like the one which I have the honor to address, have collected and arranged, and although my subject may not furnish the same field for elegant arrangement of thought or beauty of diction as some others, yet it yields to none in practical importance.

Is it not something to ascertain the chances of life and health, under diverse circumstances and varied employments? Is it not of the greatest importance to procure reliable information upon which the hard earnings thus

* Benevolent societies among the laboring classes. A paper read before the American Geographical and Statistical Society by James Wynne, M.D.

taken from daily labor to provide for inevitable but uncertain disease, shall be so husbanded as not to disappoint those, who, with no hope of future means, abstract from a small weekly allowance a sum sacred to this object. The proper disposition of this involves one of the most sacred of trusts whose influence extends far beyond the immediate recipients, and constitutes a strong bond for the good behavior and faithful citizenship of that large and worthy class who are engaged in mechanical pursuits. So long as they have confidence in beneficial sick societies, so long will they continue as a whole to appropriate a part of their earnings to their own maintenance and that of their families when disabled by accident or disease; but let this confidence be lost, and sickness will find them a charge upon the public purse, and health-careless and improvident members of society, if nothing worse.

Here is an important reason for ascertaining the foundation upon which provident societies rest; and it happens that the principles which lie at their base involve such accuracy of statistics, and such intricate mathematical calculations, as to place them beyond the reach of those more immediately concerned, and to impose the task of their elucidation upon learned men, either singly, or formed into such societies as the American Geographical and Statistical Society.

Life assurance, and government annuity offices, where the more opulent usually make provision for the future, have within the last half century done much to develop this subject so far as their own operations are concerned; but even here there is much, especially in this country, where the movements of population are not as well defined as in Europe, to be learned. I speak advisedly upon this subject, because it has been my good fortune to have been appointed by a society whose usefulness is as extensive as its vast resources, to investigate and report upon this very subject, to which report I would refer for some very curious, and, it is to be hoped, reliable information upon this subject.

It may surprise those members who have not

had their attention particularly directed to vital statistics, to learn, that within the last twelve years we have had absolutely no statistics in a reliable form upon which to base an inquiry into the principles regulating the movements and probable results of beneficial societies among the laboring classes in any country. It is true that Mr. Ansell had collected and published in 1835, under the superintendence of the Society for the Diffusion of Useful Knowledge, some valuable statistics gleaned from Scotch societies; but it remained for Mr. Neison, the eminent Actuary of the Medical Invalid and General Life Office of London, in the discharge of the duties of his office, to collect and arrange the first comprehensive series of tables upon this subject, which were read before the Statistical Society of London, in March, 1845, and published in the valuable journal of the Society in that and the following year.

I particularly allude to these papers, because, prior to their appearance, it was supposed that the chances of life were altogether in favor of the privileged classes, and that length of days was far from being a concomitant with the laborious toil and exposure of the hardy artizan; but these tables demonstrate that the chances of life were better among the latter than among any other class of which the healthiest life tables give us an account.

This is a gratifying fact, and one which demonstrates how admirably in the physical, as well as the moral world, Providence has shaped his ends, so as to measure out to each his due allowance of advantages and disadvantages.

The members of benevolent societies in every country almost exclusively belong to those who are subjected to severe toil, conjoined either to an excess of temperature, vitiated air, and constrained positions, or to the inclemencies of the seasons. Their dwellings are usually of an inferior order, and in the most unwholesome parts of towns, all of which would appear to indicate a less duration or probability of life than among those habituated to the comforts and luxuries which environ the upper classes of society, and

bestow the appearance at least of superior enjoyment and immunity from disease. But, on the other hand, it must be remembered that the payment of the small weekly stipend necessary to constitute membership, presupposes a certain degree of thrift, which places the members above the reckless and improvident, who are exposed by imprudence or want of frugality, to vicissitudes of poverty and disease.

The Massachusetts registration returns, which record the average age at death of a large number of occupations for nine years and more, exhibit a wide disparity in the chances of life in different pursuits.

While these remarks hold good in regard to the recipients of the benefits of relief societies in general, it is equally true the expectation of life is very different in different mechanical pursuits. This not only holds good in regard to the inhabitants of town and country as compared with each other, but likewise of the inhabitants of either engaged in different avocations. Thus Mr. Neison found that while the average expectation of workmen in general at the age of 30 was 36 years; that of miners was but 33, or three years less; of bakers 32, or five years less; of plumbers, painters and glaziers 30 years, or six years less, and of clerks 27, or nine years less.

The observation of Mr. Neison was followed by those of Mr. Ratcliffe, Corresponding Secretary of the Manchester Unity of Odd Fellows, and Mr. Finlaison, Jun., who was employed by the British Government to make his observations. The observations of Neison and Finlaison were based upon returns made, under an Act of Parliament, by the friendly societies; and those of Mr. Ratcliffe upon the sickness among the Odd Fellows. The three form the most reliable data on this subject extant. In this country the Rev. J. D. Williamson of Alabama, has collected the statistics of the operations of disease and mortality among the Odd Fellows for ten years, which, although more defective than the returns previously noted, are yet of much value. A slight effort upon the part of this numerous and widely ex-

tended body might furnish a series of statistics, not only of the highest value to themselves, but of the greatest importance to the cause of science.

This institution, (Odd Fellows), resembles in many of its characteristics a vast provident society, but it unfortunately contains in its organization some of the most objectionable features found in beneficial institutions. "It is," says Mr. Williamson, one of its ablest and most philanthropic members, "in its material aspect and monetary arrangements a widely-extended organization, founded upon the principles of guarantyism or assurance, and its practical operations are no more or less than an insurance upon the life and health of its members. Its provisions for the sick are an insurance upon health, and its arrangements for the benefit of widows and orphans are an insurance upon life." This society, according to its last report, numbers upwards 193,000 members, scattered over every portion of our common Union, engaged in multifarious occupations, subject to the influences of town and country life—of Northern and Southern climates, and, in short, to all the modifications which are known to exercise an important influence over health and disease.

It can furnish the experience of nearly 200,000 years of human life in a single year. It can lay its finger upon the precise amount of sickness and mortality that shall occur at every year of age in that vast circle of human experience, and in ten years it can gather a mass of facts and statistics such as is not surpassed in the world. And yet, with these facts before them, and the lively, nay, vital interest which they possess in their correct tabulation; for so certainly as they long neglect this subject, just so certainly is their body doomed to inevitable and speedy dissolution. They have up to the present moment failed to bestow upon this subject that attention which its importance and the interests of humanity demand.

The results of these various observers, although different in detail, have nevertheless some marked points of resemblance. The fol-

lowing table gives, in weeks and decimals of weeks, the average time each member of the societies, which fell under their notice, was sick during one year :

(—SICKNESS IN WEEKS TO ONE YEAR OF LIFE.—)

Age.	Finlaison.	Neison.	Ratcliffe.	William-son.
25-35 .....	.98	.91	.82	.50
35-45	1.18	1.21	1.10	.71
45-55	1.68	2.02	1.91	1.24
55-65	2.84	4.39	4.62	2.76
65-75	6.76	14.77	10.24	8.29

Now all these observations impress us with the important fact, that the liability to disease increases with great rapidity as life advances, and that while among a given number of persons, whose ages range from 25 to 35, the average amount of sickness in each year is less than one week, among those between 55 and 65, it will have increased to four weeks, and among those who have attained the mature age of 65 to 75, it will have risen to from eight to twelve weeks.

By making a due allowance for superannuation, in which the members are placed upon the sick list, we have still a formidable array of disease in the declining years of life.

My observation would hardly lead me to believe that a similar amount of disease attends the last years of the life of those in more opulent circumstances.

Yet, even here, the same law of increased sickness with advancing years is found without an exception, to obtain. In all this, we cannot fail to remark how constant and uniform nature is to her own laws. When a law of mortality or disease as it affects a certain place is ascertained, it is easy to foreshadow by its aid what will be the probable amount of sickness and mortality among those of each particular age.

No one if in health is enabled to tell whether he will sicken or remain in health during a given period ; or, if sickness occurs, whether it will be mortal or result in a restoration to health ; much less can an indifferent person single out from a community those against whose breasts the shafts of disease and death will be aimed ; but he can determine with considerable certainty the number of persons who will be attacked by disease, the average duration of

disease, and the number of cases which will eventuate in health or final dissolution.

Not only does this hold good in relation to disease and mortality, which present themselves as unbidden guests, and will not be denied admission, but also in those things where we are perfectly free to accept or reject. Take for example the case of marriage, usually a matter of pure volition on the part of those contracting its obligations. Here, as in the case of mortality, masses are found to act in obedience to laws, of which they have either no conception, or do not take into account. It is possible for a statistician in advance, not only to determine the number of marriages which will take place in a given population each year, with much exactness, but likewise to say how many of these will be contracted between bachelors and single women—how many between widowers and widows—widowers and single women—widows and bachelors, and old and young persons. Not one of the persons contracting this ceremony does so for the purpose of affecting this general statistical result. Yet, under the influence of the darts of Cupid, they are found to arrange themselves into the aggregate combinations foreshadowed by the man of science.

By far the larger proportion of marriages take place between those never before married, and between the ages of 20 and 25, although the records show some eccentricities which statistics do not pretend to account for—thus we see a youth of 16 marrying a girl of 19, and one of 17 uniting himself to a girl of 14. The oldest couple was a Mr. Calvin Kilburn, aged 91, who led to the altar a blushing bride of 70 years. In 1850 again we find a bachelor of 20 marrying a female over 40 ; one of 24 marrying a widow of 42 ; a bachelor of 35 marrying a widow over 60, and another man of 40 wedding a youthful widow of between 75 and 80.

It is obvious that if these laws are uniform, the society which acts in accordance with them will be competent to comply with whatever obligations it assumes, and that the one that disregards them will be like a ship at sea without guide or compass, always in imminent

danger of being stranded upon some hidden rock.

It appears but the part of ordinary prudence for those who are instrumental in founding and governing beneficial societies to ascertain the causes likely to affect them, and to base their future results upon them. Unfortunately such is not the fact; and, as a consequence, their foundations are often unstable and their hopes of usefulness too frequently unreal. Mr. Neilson, in order to ascertain the true condition of friendly societies in England, selected at random fifty, in which the total amount of annual contribution for the age of 35 was £1 12s. 3d.; while, in order to supply a benefit of £1 weekly for the period of sickness, which experience showed their members to be liable, the annual contribution should have been £2 7s. 9½d. The inadequacy of such a society to provide for all the benefits it proposes, is evident. "It is a most lamentable condition," he remarks, "in which to find societies aiming at designs so benevolent and praiseworthy."

The importance of this subject in England may be judged from the fact that Mr. Finlaison's tables are calculated upon the returns of 3,787 societies, embracing 542,900 members—and, from estimates by competent persons, it is believed that the number of those who belong to benefit societies throughout the United Kingdom does not fall short three millions. The number in the United States is likewise very great; but what proportion they bear to the entire population, there are no means of ascertaining. It is a matter for consideration whether a subject so closely interwoven with the welfare of a large class of our fellow citizens might not form a legitimate subject of inquiry in our next census.

I have taken some pains to ascertain the condition of friendly societies in this city. The number is large, the membership great, and the dues and benefits in most of them discharged with a praiseworthy regularity; but in none do I find either a correct series of statistics of past operations or a prudential and certain provision for the future. The larger proportion of

these societies have been recently organized, few extending back beyond ten or fifteen years, and most of their members are comparatively young men. A society of this kind may survive for twenty-five or thirty years, with all the external appearance of perfect security. Those who manage its affairs finding its income exceeding its expenditure, and a small fund accumulating, are disposed to look upon it as highly prosperous and worthy of all confidence; but, in so doing, they too frequently lose sight of the large increase of expenditure, which the inevitable infirmities of its older members will sooner or later require at its hands. The two oldest and apparently best conducted beneficial societies in the city are the Tailors' Benevolent Society, about twenty-five years old, and the Typographical Society, founded in 1809. Neither of these societies has an accumulated fund for future use beyond two or three thousand dollars. Hitherto they have been enabled to discharge their assumed obligations by the falling off of many old members, from various causes, before they become burdensome by the natural march of infirmity, and the accession of young and vigorous members; but these chance contingencies cannot be supposed always to act in their favor, and the time may soon arrive when the increase of sick allowances will far exceed the income from the weekly stipend paid by their members.

So long as an influx of young members continues, the funds may appear to maintain a position of apparent prosperity; but when the members shall have passed the meridian of life, and have begun to experience the infirmities of years, the stability of these societies will come to be fairly tested.

The almost invariable practice is to admit members of every age, not excluded by their age from admission at all, upon the same terms. This is clearly unfair to the younger members, who have not only a large amount of vitality and probable exemption from disease, but will be obliged to delay the reception of their benefits until the society may be in no condition to respond to them. All the contingencies of

profit and loss are in favor of the older members and against the younger ones; and it seems but reasonable that the scale of admissions and weekly dues should be graduated with reference to this disparity.

The importance of this subject not only to those who are the immediate recipients of the benefits, but to those whose duty it is to provide for the indigent, when unable to provide for themselves, cannot well be over estimated. The highest legislative capacity, in the most civilized nations of the world, has always been directed to subjects akin to this. A remarkable feature of our own legislation is that matters of this kind seldom burden our statute book, or the thoughts of our grave legislators.

When the Statistical Congress recently assembled at Brussels, royalty felt itself honored by entertaining the learned men gathered from every part of Europe at a regal banquet. At a meeting of the Association for the Advancement of Science held a few years since, at Washington, the President of our own Republic permitted them to assemble and depart without any official or social acknowledgment of their presence.

I allude to these facts for the purpose of showing how little aid can be expected from our own general or municipal governments, until forced to consider these subjects by a pressure from without, which they will find themselves unable to resist; and to urge upon this Society, whose members are influenced by loftier motives and more disinterested zeal than is now found in our legislative halls, to take this important subject into their respectful consideration. Secure to the laboring classes a safe investment for the money appropriated by them to provide for future sickness, and you will diminish in like proportion the sum required to be paid for the maintenance of pauperism. Let these sums be frittered away in unsubstantial foundations, and pauperism and its associate charges must inevitably increase.

The American Geographical and Statistical Society cannot be more usefully employed than in elucidating the questions which form the subject of this paper.

WHITE POPULATION OF S. CAROLINA.

A decennial State census has been taken since 1809, with the following results:

	Total.		Total.
1809	217,482	1839	257,117
1819	231,828	1849	280,585
1829	250,943	1859	304,112

	Increase	Ratio.
	Absolute.	P. C.
1809-19	14,346	6.59
1819-29	19,115	8.24
1829-39	6,174	2.46
1839-49	23,468	9.12
1849-59	23,527	8.39

—And the following is given as the early enumerations of the white population in 1670, 150; in 1700, 5,500; in 1723, 14,000; in 1734, 7,233; in 1765, 40,000; in 1773, 65,000; in 1792, 146,178, and in 1800, 196,255.

PORK TRADE OF INTERIOR STATES.

The pork trade has become one of vast importance and is yearly increasing. It is chiefly carried on in the States immediately bordering on the Ohio and Mississippi Rivers. The number of hogs annually slaughtered is now nearly two millions and a half; in 1857-8, it was 2,208,975, and in 1858-9, 2,436,863, showing an increase in the latter on the former year of over 10 per cent. The slaughter returns for the States severally are as follows:

	1857-8			1858-9		
	Number of hogs.	Average wt. lbs.	Yield of lard, lbs.	Number of hogs.	Average wt. lbs.	Yield of lard, lbs.
Ohio	610,000	241	28	624,109	196	23
Indiana ..	441,885	202	31	407,636	186	22
Illinois ..	463,577	202	37	596,136	183	27
Wisconsin	16,000	235	30	32,702	230	28
Iowa	85,583	199	39	158,217	173	22
Missouri ..	176,386	202	27	155,774	174	23
Kentucky ..	372,609	212	31	397,117	217	33
Tennessee	42,875	213	37	65,172	218	39

From this table, however, it is evident that although the number of hogs slaughtered was so much in advance of the slaughter of the preceding year, the products were not commensurately increased, as both the average weight and the yield of lard were much less per hog. As regards the average weight there was an increase in the latter year of about 6 per cent., and as regards the falling off in the lard it has been nearly 5 lbs. per hog. The returns above given embrace 179 places at which hogs were slaughtered.

STATISTICAL REPORT OF THE SONS OF TEMPERANCE OF NORTH AMERICA,*

Being a Synopsis of Returns of Grand Divisions of the Order, for the term beginning January 1st, 1858, and ending December 31st, 1858, both days inclusive:

Grand Divisions.	No of Divisions.	Admitted.	Suspended.	Expelled.	Deaths.	Violated Pledge.	Re-instated.	Violated Pledge 2d time.	Contributing Members.	Divisions Accept'g Lady Visitors.	Lady Visitors.	Cash Received.	Paid for Benefits.	Cash on Hand and Invested.
E. N. York ..	33	376	98	132	9	68	32	20	1,254	14	392	\$4,639	\$2,034	\$16,590
W. N. York ..	49	672	233	193	11	118	47	24	1,314	24	1,027	1,064	900	4,695
New Jersey ..	36	192	77	150	6	48	31	15	1,210	4	100	3,237	1,266	9,587
Maryland ...	46	627	152	145	11	128	261	9	2,015	34	962	5,733	2,204	25,493
Pennsylvania	74	1,475	90	304	19	138	17	29	3,899	28	..	13,257	4,586	20,115
Connecticut..	4	23	9	18	1	5	2	..	200	4	75	669	344	3,119
Massachusetts	88	5,496	256	199	14	235	137	32	6,261	78	5,963	16,879	2,323	9,352
Virginia.....	234	3,532	334	1,162	77	1,150	455	148	6,483	116	..	14,472	7,219	29,082
Maine.....	67	1,510	177	191	7	101	44	..	2,661	40	1,609	2,905	292	1,598
Ohio.....	126	2,110	224	481	34	417	201	73	3,859	81	3,377	5,547	779	9,592
Delaware....	4	9	..	4	..	4	2	..	118	..	..	291	81	1,357
Indiana.....	75	2,220	336	382	28	377	145	38	2,430	50	1,200	6,889	334	7,000
Tennessee...	45	605	30	153	15	195	65	17	1,800	..	..	1,876	282	4,310
N. Carolina..	71	1,123	212	502	23	438	301	257	2,383	65	1,200	1,077	375	5,987
Kentucky...	50	350	229	356	15	272	93	30	1,312	35	..	1,420	231	6,133
Georgia.....	31	290	..	38	13	43	11	9	661	..	..	737	58	1,955
Illinois.....	64	1,731	294	296	22	314	79	43	2,851	..	1,183	6,914	273	2,188
Rhode Island.	13	241	9	78	6	72	23	41	560	12	432	130	61	1,106
Missouri.....	56	1,811	287	273	16	321	89	20	2,042	34	810	1,068	323	5,229
N. Hamp....	6	70	..	..	..	..	..	..	106	2	33	..	..	..
Louisiana....	8	151	75	84	8	41	24	23	279	..	..	1,268	314	2,495
S. Carolina...	57	979	172	257	17	176	56	26	1,751	16	452	2,968	91	1,822
Alabama.....	8	149	25	68	3	56	31	11	235	3	..	582	..	4,830
N. Brunswick.	89	1,361	116	447	20	292	154	51	5,751	33	735	6,734	1,364	10,556
Mississippi...	14	102	6	133	3	133	42	14	617	3	..	192	125	4,955
Iowa.....	11	218	149	28	1	22	8	1	344	..	..	534	12	189
Wisconsin....	8	93	33	16	1	11	6	3	197	8	..	126	6	146
N. Scotia....	18	1,984	298	640	14	274	141	75	3,491	50	854	6,318	1,317	5,589
Vermont.....	10	253	24	18	4	13	6	..	478	5	113	751	38	2,571
Texas.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Arkansas....	50	228	32	67	6	63	28	9	579	25	..	445	10	232
Florida.....	11	242	5	87	2	125	26	9	1,385	8	..	769	84	3,508
Pr. Ed. Isl'd.	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Canada W....	335	4,018	2,220	2,055	47	1,135	416	113	10,479	129	3,468	13,728	784	23,582
Newfound....	1	14	..	..	..	10	1	..	104	1	3	576	42	1,000
California...	75	1,850	546	586	23	510	189	70	2,033	60	..	15,890	2,426	32,919
Canada E....	15	466	188	133	4	69	47	15	667	..	..	1,323	50	1,222
E. Tenn.....	13	199	93	59	5	68	25	6	392	..	..	402	75	454
S. Kentucky...	63	757	177	222	10	266	88	74	3,580	63	..	918	3,615	5,915
Oregon.....	21	160	..	27	..	23	10	2	650	21	..	1,200	..	400
Wash. Ter....	6	..	..	..	..	..	..	..	..	..	..	..	..	..
Total	1,985	37,987	7,206	9,986	495	7,752	3,353	1,307	76,422	1,046	23,988	\$146,448	\$34,317	\$285,876

LOMBARDY.

It is not without interest to estimate the pecuniary loss which Austria will suffer from giving up Lombardy. This province, which has a superficies of 8,331 square miles, contains

3,009,505 inhabitants. It has contributed to the total receipts of Austria, in direct and indirect taxes, which in 1856 amounted to 335,976,150 florins, a sum of 36,185,631 florins. That part is proportionably very considerable; for whilst in the whole monarchy the tax is on an average of 8 fl. 53 kr. per head, it amounts in Lombardy on an average to 12fl. 28 kreutzern.

* An Abstract from the Journal of the Proceedings of the National Division of the Sons of Temperance of North America; 16th Annual Session, held at Philadelphia, June, 1859.

Both in an agricultural and industrial point of view Lombardy was one of the richest provinces of the monarchy. The value of landed property is officially estimated, according to the net produce, at a capital of 1,054,722,666 florins, and the value of the soil only at 159,409,925 florins. The annual industrial revenue of the Lombards, among whom the lists of the contributors reckon 7,304 dealers and manufacturers, 1,216 hawkers, 60,700 workmen in factories, 56,388 servants, and 357,489 journeymen, is estimated at 61,858 florins. The Austrian florin is worth about 50 cents of our money.

ECUADORIAN DEBT.

The debt of Ecuador to the British public amounts to £1,824,000, bearing a minimum interest of one and a maximum of six per cent. For the due payment of the interest one-fourth of the customs receipts of Guayaquil have been specially hypothecated. The bondholders have lately memorialized the Foreign office to interfere in protecting their interests, viewing the blockade of that port by the Peruvians as a serious confiscation of their property, and the Minister has promised to pay due attention to the subject.

From the same memorial we learn that the Ecuadorian Government has adjudicated to the British bondholders 4,500,000 acres of land, in payment of £566,600, being part of the debt, and issued therefor 5,666 land warrants of £100 each. These lands consist of five distinct assignments, three of which—the Pailon, Atacames, and Molletura—are situated west of the Cordillera, and two—the Camelos and Gualaquira—lie to the eastward of these mountains. The holders of the land warrants have formed themselves into a company, and had in view the immediate occupation of the lands.

But to this arrangement the Peruvian Government objects, and it would appear that the proceedings of the Ecuadorian authorities in this matter are the pretext for the present war. Peru claims the lands sequestered as a part of

her own domain; and, furthermore, has become jealous of British influence on the Amazon.

Should it be the intention of the British Government to interfere in this affair, we may anticipate difficulties on the western coast, in which our Government may have a word or two on the subject of American interests, as our commerce in these regions has of late years become somewhat extensive, and will in the future seek a magnificent development.

COAL TRADE OF WESTERN PENNSYLVANIA.

The bituminous coal trade of Western Pennsylvania is rapidly assuming a magnitude of which few are aware.

The Pennsylvania Railroad carried during the year 1858 no less than 187,535 tons, viz.; from Blairsville 4,560 tons, from Latrobe 18 tons, from Manor Station 16,967 tons, from Irwin's 59,278 tons, from Larimer's 44,409 tons, from Brinton's 296 tons, and from Wilksburg 62,007 tons, and delivered at Philadelphia 73,915 tons, at Pittsburg 98,542 tons, and at way stations 14,078 tons. This exhibit does not include 80,000 tons used by the railroad company, nor does the report state where that quantity was obtained.

During the same year the Pittsburg and Connellsville Railroad carried 7,902 tons, and the Alleghany Valley Railroad 20,622 tons; while the Monongahela Navigation carried 25,696,669 bushels, and the product of the mines below the Navigation amounted to 3,291,666 bushels.

Reducing the tons to bushels at the rate of 26½ to the ton, the aggregate coal trade of the Pittsburg district may be set forth as follows:

Carried by Pennsylvania Railroad.....	4,969,677 bush
Used by "do....."	2,120,000 "
Carried by Pittsburg and Conn. RR.....	209,404 "
Carried by Alleghany Valley RR.....	546,483 "
Carried by Monongahela Navigation.....	25,296,669 "
Products of other districts.....	3,291,666 "

Total Pittsburg and vicinity.....36,833,892 bush.

Valued at 5 cents a bushel, this amount would net \$1,841,694; but on the average it must sell at a higher price, and, therefore, we may safely set down this trade in its present state of development as worth two millions of dollars a year.

WHEAT CROP OF THE UNITED STATES.

The wheat crop of 1859 has generally been harvested throughout the country, and sufficient is known to make a careful estimate of this important staple, interesting for present consideration and important for future reference. This has been done by the *New York Courier*. Compared with 1858, the estimate is as follows:

State.	1858—Bush.	1859—Bush.
New York.....	20,000,000	22,000,000
Pennsylvania.....	20,000,000	25,000,000
Virginia and N. Carolina..	18,500,000	20,000,000
Kentucky.....	18,500,000	11,000,000
Ohio.....	22,000,000	26,000,000
Indiana.....	13,000,000	17,000,000
Illinois.....	14,500,000	20,000,000
Other States.....	42,000,000	60,000,000
Total.....	158,500,000	201,000,000

The production in the Western States, which have the largest surplus for export, is shown by the following figures:

State.	1858—Bush.	1859—Bush.
Kentucky.....	8,500,000	11,000,000
Ohio.....	22,000,000	26,000,000
Indiana.....	13,000,000	17,000,000
Illinois.....	14,500,000	20,000,000
Total.....	58,000,000	74,000,000

The surplus for the present year in these States may be estimated as follows:

	Bush.
Crop 1859.....	74,000,000
Consumption 5 bush per head.....	36,000,000
Surplus crop 1859.....	38,000,000

It is estimated that in addition to this, from one-sixth to one-fifth of the surplus crop of 1858 is yet in the hands of the producers. We therefore have in the States, estimating last year's surplus crop of the West at twenty-four millions of bushels, as the gross:

	Bush.
Surplus crop of 1859.....	38,000,000
Sixteen $\frac{1}{4}$ per cent on 1858.....	4,000,000

Total for export.....42,000,000

The total transportation of this at forty cents per bushel will give nearly seventeen millions of dollars to our canals and railroads.

ENGLISH COPPER MINES.

From *Gryll's Annual Mining Sheet*, we condense the following interesting statistics of the

Copper Mines of Cornwall, for the year ending June 30th, 1859:

About 120 mines in Cornwall sent copper to the "ticketing," or sales, during the year, making a total of 183,944 gross tons, of 21 cwt. each. The mine sending the largest quantity was the "Devon Great Consols," which turned out 23,748 gross tons; the "United Mines" turned out 9,815 tons; "West Basset" 7,036 tons, and "West Seton" 6,205. Five other mines exceeded 5,000 tons each, three over 4,000 tons each, six over 3,000 tons each, seven over 2,000 tons each, twenty-one over 1,000 tons each, and the balance ranging from 120 to 900 tons each.

The highest average price for ore sold during the year was that of the "Graumbler and St. Aubyn" mine, £17 2s. The total amount received for the ore sold was £1,079,075 17s., or over five and a quarter million dollars. The average price of the ore sold was £5 17s. 6d. The ore produced 11,888 tons fine copper, the average standing price of which was £133 6s. The average produce of the ore was $6\frac{1}{2}$ per cent. of fine copper.

We give below a table of the copper ores raised and sold in Cornwall during the past twenty years, showing the number of gross tons sold, the total amounts for which it sold, the per centage of fine copper produced, and the average value of the standard copper:

Date.	Ore (21 cwt.)	Money. £	Produce. Standard. £ s.
1840.....	147,266	792,758	7 $\frac{1}{2}$ 108 10
1841.....	135,090	619,900	7 $\frac{1}{2}$ 119 6
1842.....	135,581	822,876	7 $\frac{1}{2}$ 120 16
1843.....	144,806	804,445	7 $\frac{1}{2}$ 110 1
1844.....	152,667	815,346	7 $\frac{1}{2}$ 109 17
1845.....	157,000	835,350	7 $\frac{1}{2}$ 103 10
1846.....	158,913	886,785	7 $\frac{1}{2}$ 106 8
1847.....	148,674	830,739	8 103 12
1848.....	155,616	825,080	8 $\frac{1}{2}$ 97 7
1849.....	144,983	716,917	8 $\frac{1}{2}$ 92 11
1850.....	150,890	814,037	7 $\frac{1}{2}$ 103 19
1851.....	154,299	808,244	7 $\frac{1}{2}$ 101 0
1852.....	152,802	828,057	7 $\frac{1}{2}$ 106 12
1853.....	180,095	1,124,561	6 $\frac{1}{2}$ 136 16
1854.....	180,687	1,153,756	6 $\frac{1}{2}$ 140 2
1855.....	188,969	1,212,686	6 $\frac{1}{2}$ 141 10
1856.....	209,305	1,233,639	6 $\frac{1}{2}$ 140 0
1857.....	198,697	1,276,844	6 $\frac{1}{2}$ 139 6
1858.....	183,297	1,083,728	6 $\frac{1}{2}$ 135 1
1859.....	183,944	1,079,075	6 $\frac{1}{2}$ 133 6

EXPORTS OF OHIO.

The Commissioner of Statistics gives in the annexed statement the quantity of each of the agricultural products of the State of Ohio exports in the commercial year 1857-8:

Articles.	Export by RR.	Export by Lake.	Export by Rer.	Agg'd ex.
Flour, bbls.....	1,097,582	475,927	227,470	1,860,979
Wheat, bush.....	2,607,113	2,607,113	.....	2,607,113
Other grain, bush.....	956,595	1,980,667	.....	2,937,262
Whisky, bbls.....	142,370	63,561	.....	377,507
Alcohol, bbls.....	.....	.....	69,071	69,071
Beef, bbls.....	6,000	227	14,202	20,427
Pork and bacon, bbls.....	361,541	7,616	95,200	464,457
Lard, bbls.....	65,000	720	18,475	84,176
Lard Oil, lbs.....	8,000	.....	40,625	48,625
Butter, lbs.....	7,292,719	18,690	1,424,725	8,735,124
Cheese, lbs.....	3,541,337	11,795	3,180,000	6,736,122
Candles, boxes.....	.....	33,560	155,257	156,096
Soap, boxes.....	.....	560	51,708	52,568
Tallow, lbs.....	.....	303,760	460,800	764,560
Groase, lbs.....	.....	.....	740,600	740,600
Cattle, No.....	118,000	.....	.....	118,000
Horses, No.....	5,000	.....	.....	5,000
Hogs, No.....	341,595	.....	2,400	341,595
Sheep, No.....	220,557	.....	.....	220,557
Wool, lbs.....	6,332,000	1,321,397	919,376	7,572,763
Coal, bush.....	.....	6,600,000	3,000,000	9,600,000
Tobacco, hds.....	20,345	750	205	20,925
Eggs, bbls.....	.....	1,000	17,000	18,000

ALBANY LUMBER TRADE.

Albany, New York, is one of the largest lumber markets of the Union. The following table exhibits the receipts during the years named:

	Boards of scantling, ft.	Shingles, M	Timber cub. ft.	Staves, lbs.
1850....	216,791,890	33,226	28,832	150,515,280
1851....	200,238,003	34,136	110,200	115,087,290
1852....	317,135,620	31,636	291,714	107,961,289
1853....	393,726,073	27,586	19,916	118,666,750
1854....	311,571,157	24,003	28,909	134,805,091
1855....	245,921,652	57,210	21,104	140,255,225
1856....	223,345,545	36,899	14,533	102,548,492
1857....	190,097,629	71,004	85,104	153,264,629
1858....	267,406,411	31,823	119,497	135,011,817

— the value of which in the same years was as follows:

1850....	\$3,251,878	\$119,791	\$4,325	\$677,319
1851....	4,119,568	121,524	19,010	546,665
1852....	5,495,960	110,726	52,509	507,418
1853....	6,299,617	99,585	3,386	569,600
1854....	4,985,139	86,891	6,649	611,123
1855....	4,426,569	228,540	4,854	631,149
1856....	3,573,520	129,147	2,616	461,468
1857....	2,891,560	248,515	15,218	669,691
1858....	4,412,205	111,383	20,314	540,047

HOW MUCH CAN PEOPLE PAY ANNUALLY FOR THE TRANSPORTATION OF PERSONS AND PROPERTY?

In the construction of a railroad, or of a system of railroad, a lucrative business is assumed as a matter of course. Our people never stop to consider whether there must not be a limit to the ability of a people to contribute to the support of such works—a necessary relation between their number and the extent of their commerce—and whether all beyond a certain outlay for works of improvement must not remain without adequate employment.

What is the extent of the contributions that a community can make toward the support of railroads? The people of Massachusetts pay more to these works than any other community in the world. The receipts of her roads compared with her population for nine years past have been as follows:

	Earnings.	Population.
1850.....	\$7,089,159	973,654
1851.....	7,281,346	1,005,397
1852.....	7,713,208	1,037,140
1853.....	8,966,441	1,068,883
1854.....	9,973,377	1,100,626
1855.....	10,100,914	1,132,369
1856.....	10,884,667	1,164,112
1857.....	10,583,574	1,195,855
1858.....	9,522,968	1,227,598

The above statement shows the ratio of earnings of railroads in Massachusetts to be very nearly nine dollars to each person.

In England and Wales, the largest earnings for any one year, 1858, were \$97,862,781, for a population of about 19,100,000, giving a ratio of \$5.12.5. to each person.

The earnings of the railroads of New York for 1856 were \$21,289,340. Population for the same year, 3,550,000. Ratio of earnings to population, \$6.

New England has a railroad system peculiar to itself. Only a very small portion of its receipts is contributed by the people of other States. The earnings of its roads for 1856 were \$18,657,273: its population very nearly 3,100,000: ratio of earnings to population the same as in New York, \$6 per head.

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